USER INSTRUCTION MANUAL

Bottero

Glass Technologies

EVO MODEL CUTTING TABLES

340BCS evo
340LMT evo
352BCS evo
352LMT evo

Code: EVO-UM-IN
Revision: 1
Edition: 18 / 01 / 2009
Language: English

Translation of the original instructions

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Glass Technologies

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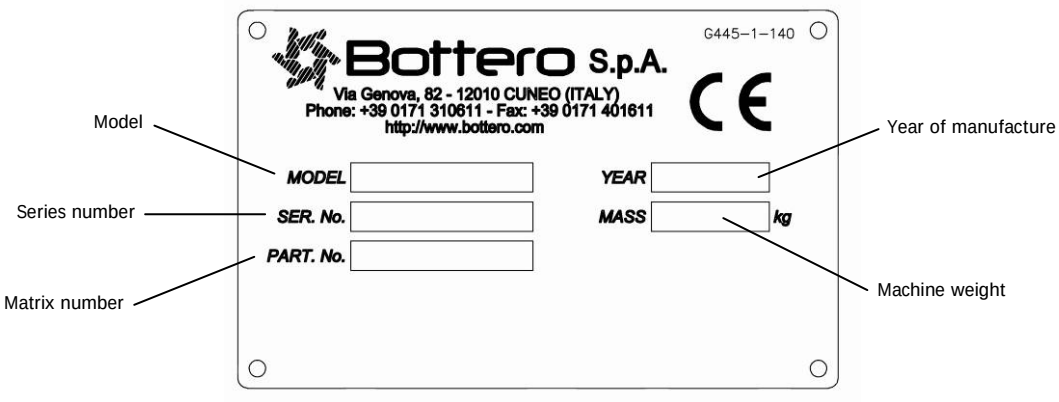
We thank you for having chosen us and for having purchased our product. For the best performances, we suggest you strictly keep to the instructions herein. For the assistance service, our technicians are always at your disposal.

In case of the request for technical assistance, one must have the following data and material before calling our technical service:



Also:

- **Electrical drawings** (Present in the documentation box)
- **Instruction manual** (Present in the documentation box)
- **Spare parts booklet** (Present in the documentation box)
- **Version of the program installed** (Machine program key F1)

After having acquired this information, phone +39 0171-310611

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SUMMARY AND DESCRIPTION OF THE SECTIONS

0-002

Section	Title	Notes	Page
A	**Introduction**		A-1
B	**Accident prevention rules**		B-1
C	**Informative labels**		C-1
D	**Access to machine working areas**		D-1
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REVISION INDEX

0-003

Rev.	Date	Revision Description	Page No.
1	**18/01/2009**	**The second and next to last page. We have inserted replacing carriage extra-run rubber buffers and the section R consumables. The machine start-up shutdown with Optional POWER PACK update has been added.**	**190**

CONSTRUCTIVE CRITERIA

0-005

The machines described in this instruction manual have been manufactured respecting the directives:

- 98/37/CE **MACHINE DIRECTIVE**
- 2006/95/CE **LOW VOLTAGE DIRECTIVE**
- 2004/108/CE **ELECTROMAGNETIC COMPATIBILITY**

The machines described in this manual are not suitable to be operated in an environment with risk of explosion, directive reference **ATEX 94/9/CE.**

LEGAL NOTES

0-004

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Bottero S.p.A. does not assume any responsibility or obligation for any mistakes or imprecisions in this manual.

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A INTRODUCTION

SECTION SUMMARY

Foreword _____ A-3
How to use the instruction manual _____ A-3
Type of configuration _____ A-4
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SYMMETRICAL cutting table _____ A-4
Description of the single machines _____ A-5
352BCS^{evo} CUTTING TABLE _____ A-5
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Foreword

A-001

In this use and maintenance manual, we will provide you with all the necessary instructions on the use of the purchased machine and on how to carry out maintenance on it.
All these operations will be described paying particular attention to the safety procedures to be used, to avoid direct and indirect dangers to personnel.
This manual aims to inform the user on how to safely use the machine, in full respect both for himself and for others.

This use and maintenance manual must be supplied to the personnel that operates the machine, both for the use for which it was designed as for its maintenance.

How to use the instruction manual

A-002

This instruction manual is divided into main sections, each one on a specific subject.
The sections list is reported in the **SUMMARY AND DESCRIPTION OF THE SECTIONS** table at page **III**.
At the beginning of every single section, there is an index of the subjects described therein.
Both the operator and the maintenance have to be acquainted with all the sections in this instruction manual.

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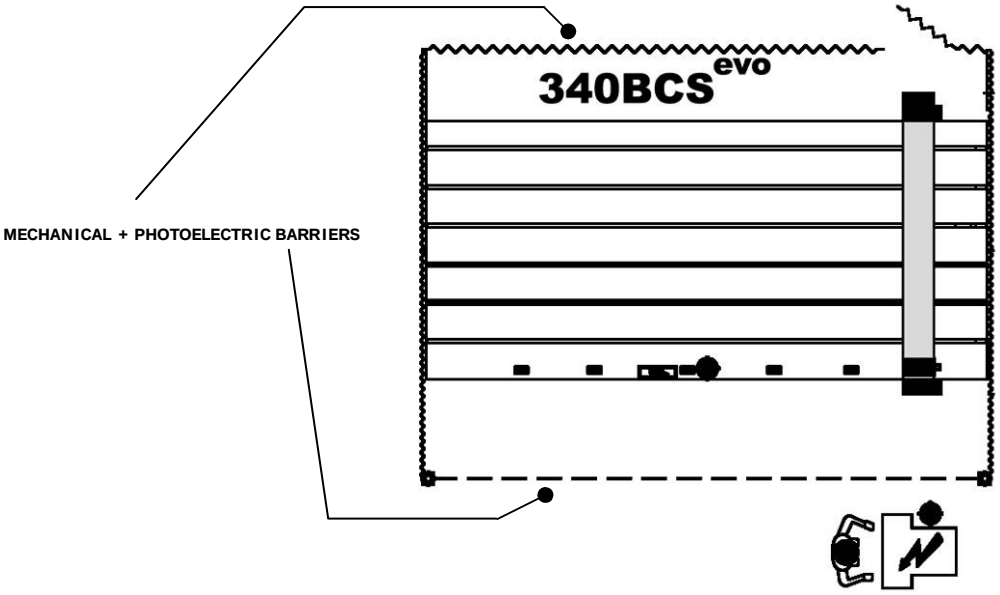
Type of configuration

A-004

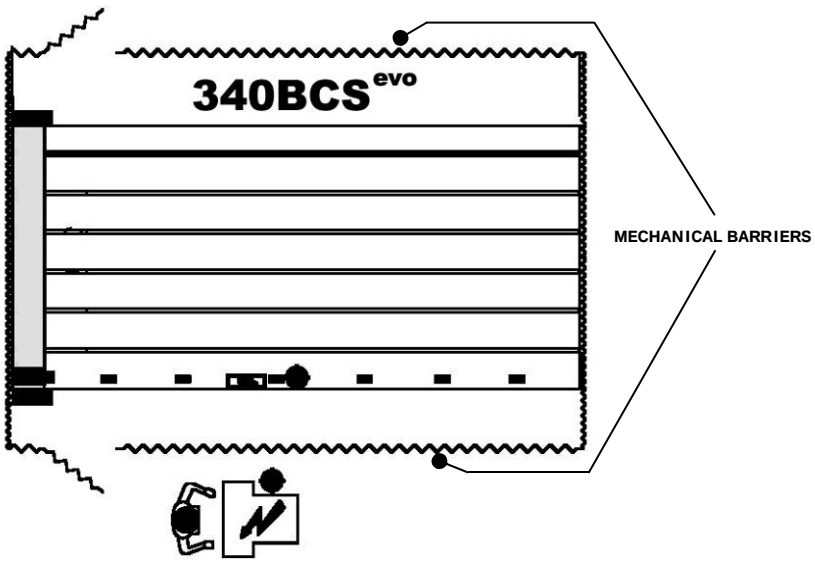
The Evo model cutting tables can be produced in the Standard and Symmetrical configuration.

In the following example, two configurations of the 340BCS^{evo} cutting table

STANDARD cutting table



SYMMETRICAL cutting table



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Description of the single machines

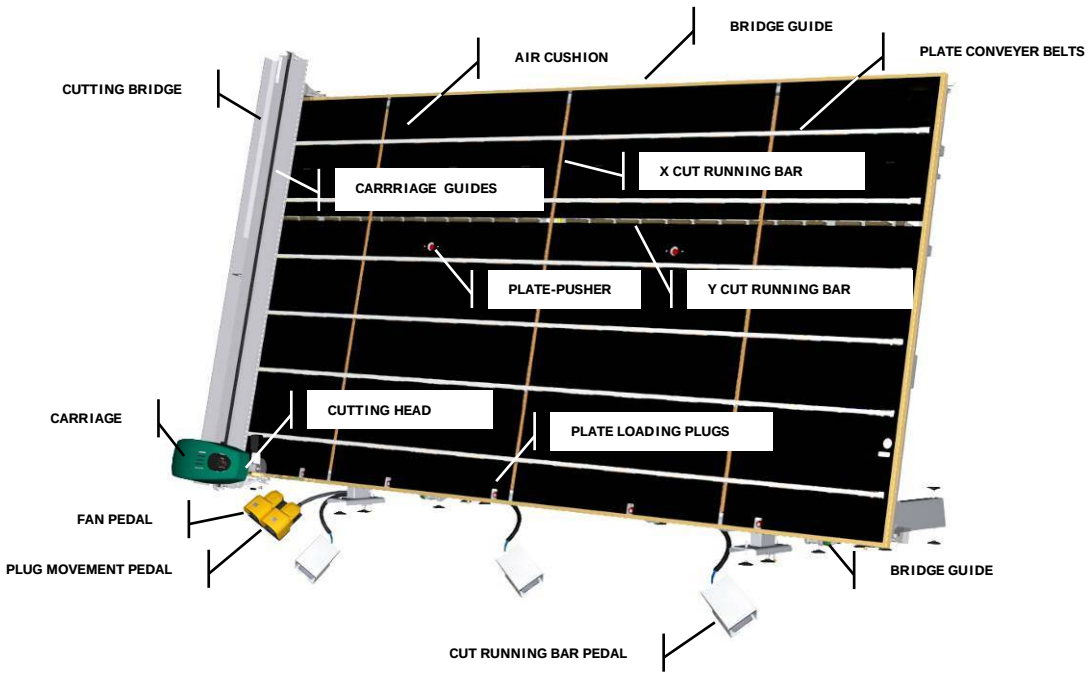
A-005

To better describe the machines in this use and maintenance manual, the following are images of the single machines with at the side a technical description of some of their components.
For machine configurations, refer to the specific techniques and to the layouts.

352BCS^{evo} CUTTING TABLE

Name: 352BCS^{evo} balancing cutting table
Dimensions: Regular and Jumbo

Machine composition: Front view



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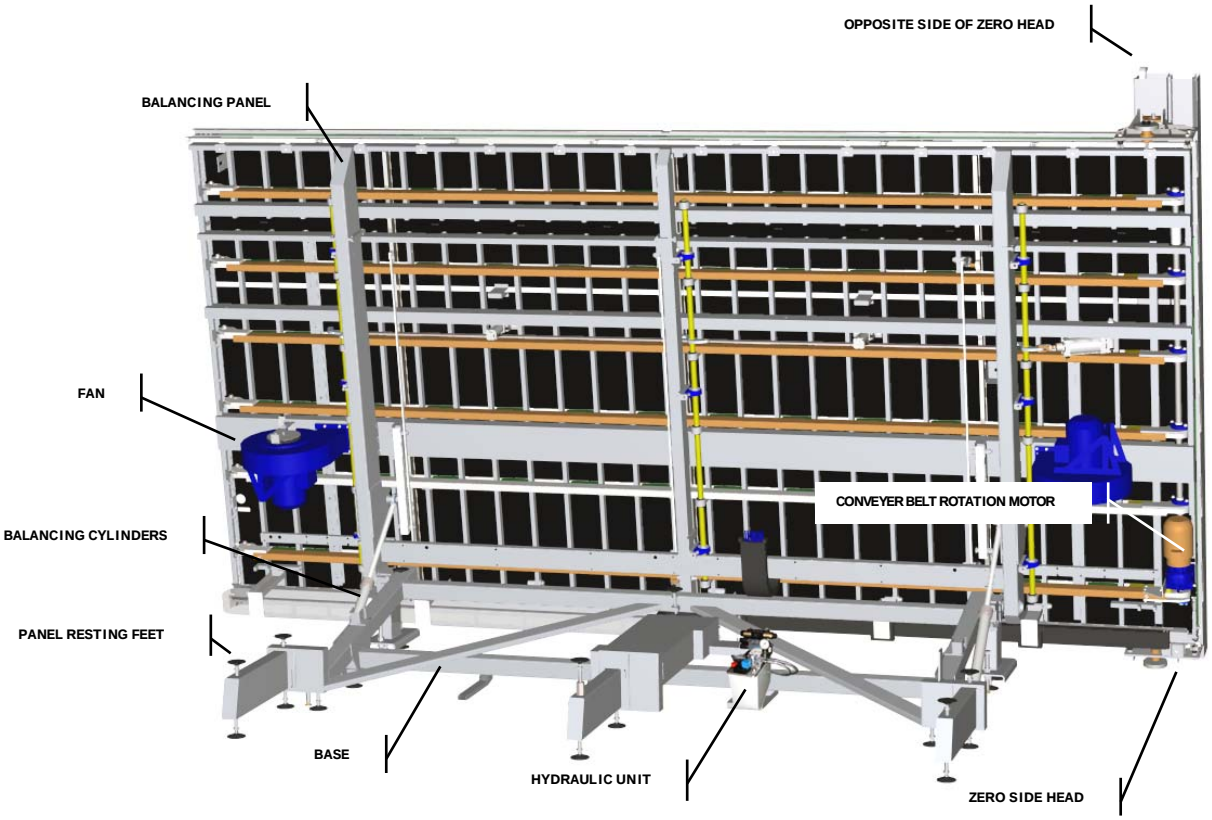
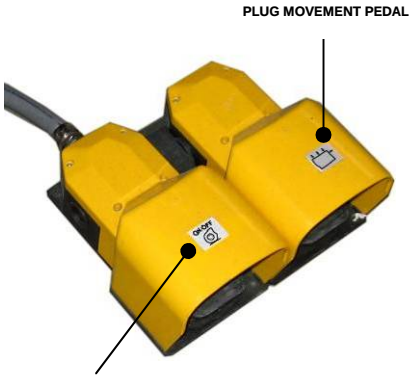
Rear view





Optional
Easy deletion

OPTIONAL
POWER PACK

<u>Easy Deletion:</u> An optional feature that makes it possible to work with glass that is covered by a film (*couche*) made of a specific material (metal oxide), that significantly improves its thermal insulation properties, without substantially modifying its light transmission performance.

<u>Power Pack:</u> An optional package that includes an uninterruptible power supply (also know as UPS), equipment that is used to maintain continual power supply to electrical appliances.

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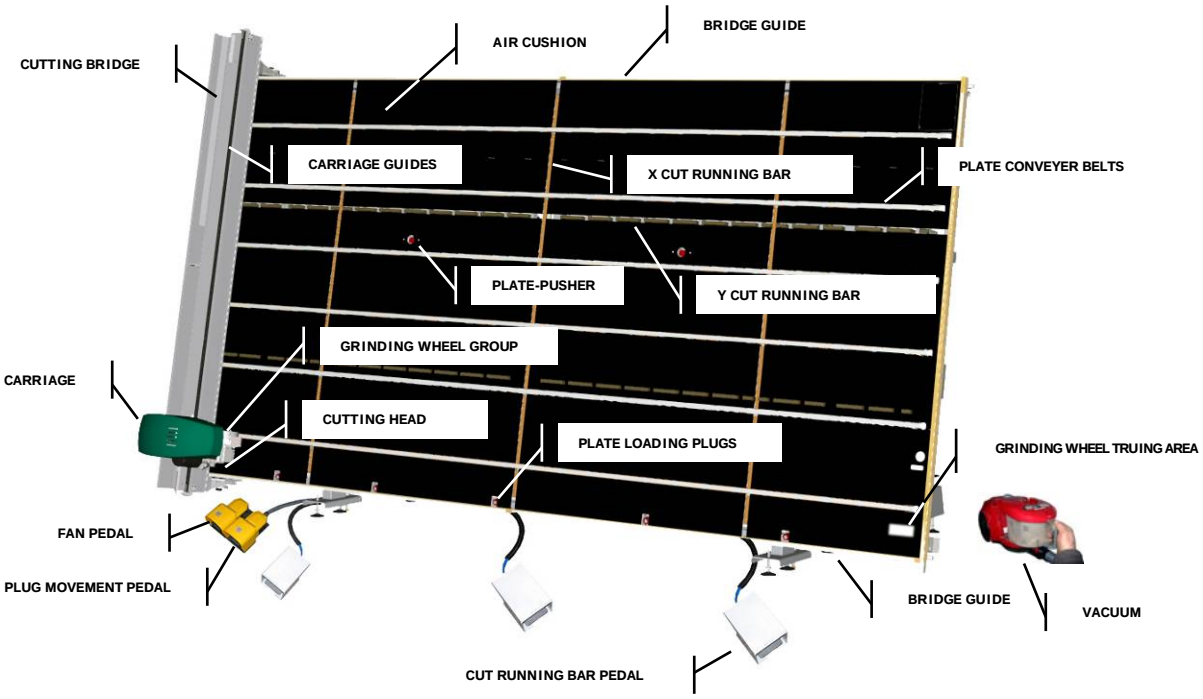
352 LMT^{evo} CUTTING TABLE

A-007

Name: 352LMT^{evo} balancing cutting table
Dimensions: Regular and Jumbo

Machine composition: Front view



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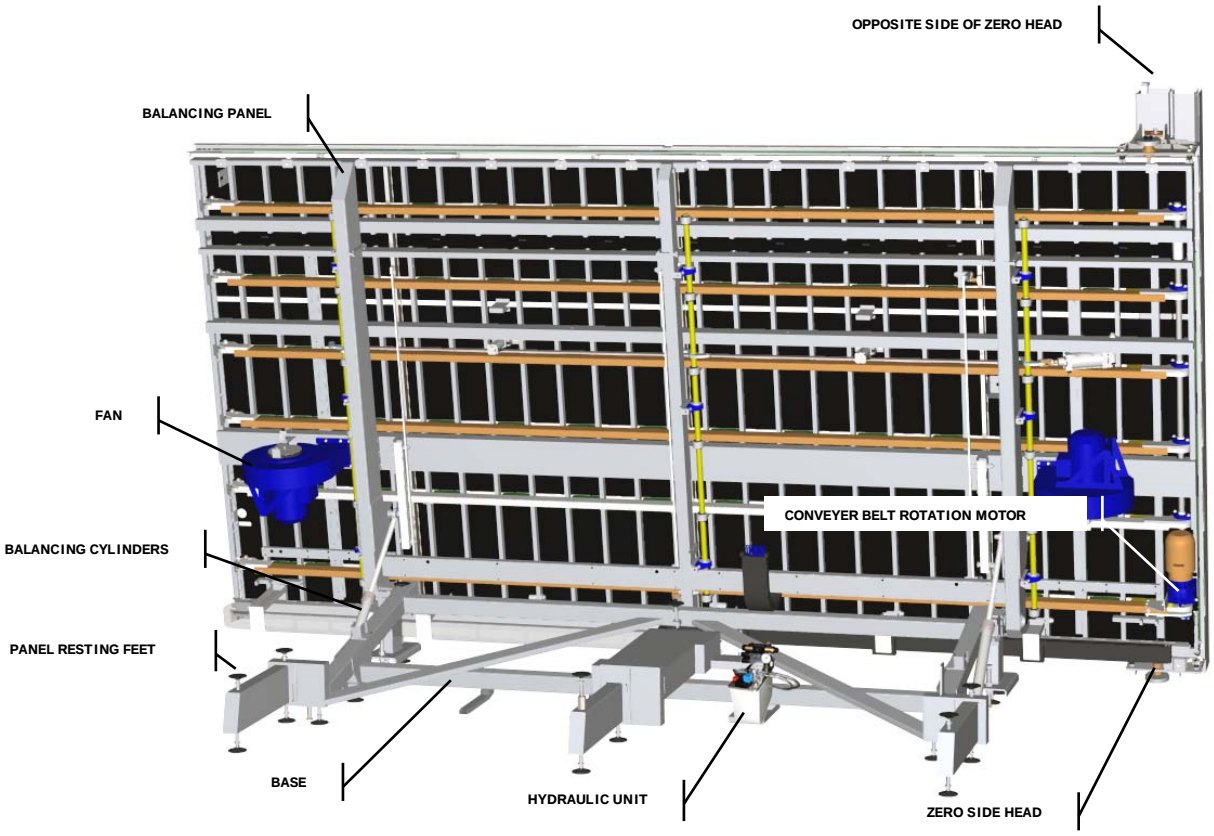
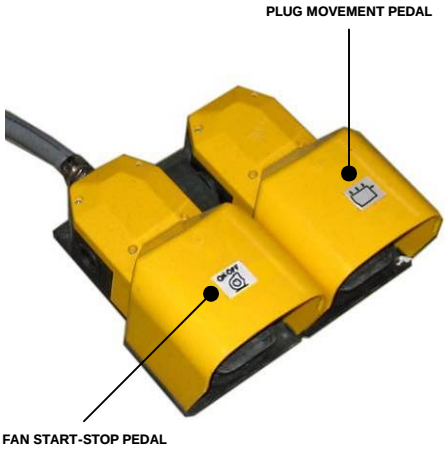
Rear view





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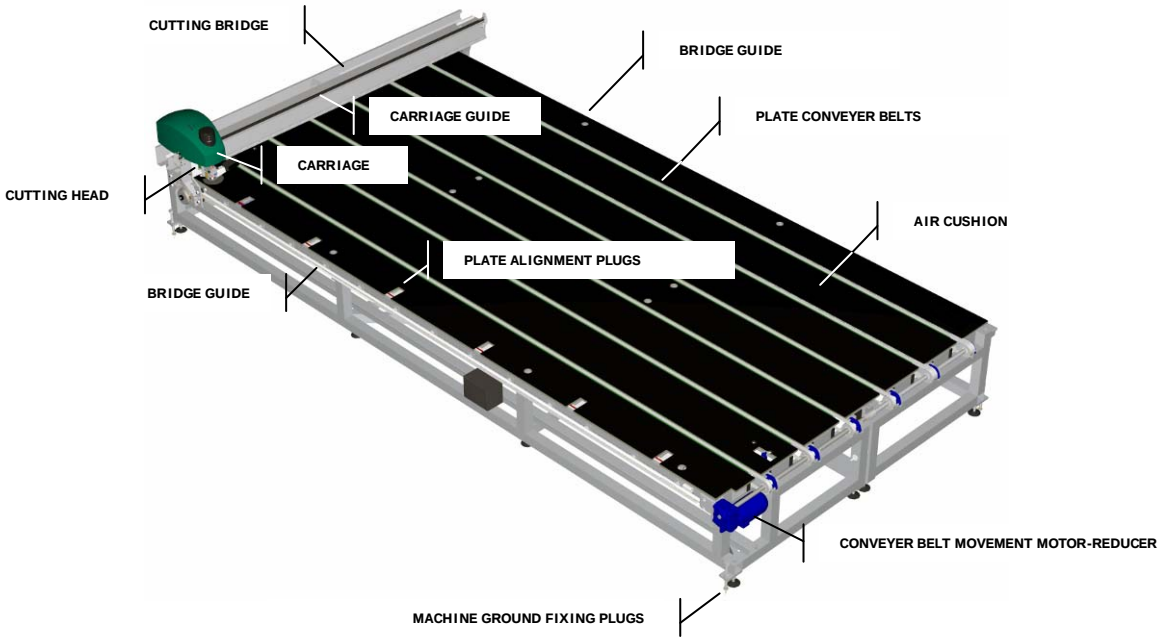
340BCS^{evo} CUTTING TABLE

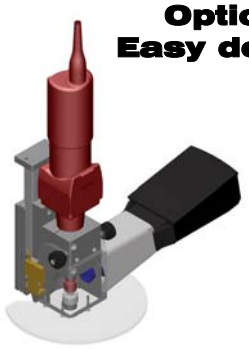
A-009

Name: 340BCS^{evo} balancing cutting table
Dimensions: Regular and Jumbo

General view



Optional
Easy deletion



OPTIONAL
POWER PACK

<u>Easy Deletion:</u> An optional feature that makes it possible to work with glass that is covered by a film (*couche*) made of a specific material (metal oxide), that significantly improves its thermal insulation properties, without substantially modifying its light transmission performance.

<u>Power Pack:</u> An optional package that includes an uninterruptible power supply (also know as UPS), equipment that is used to maintain continual power supply to electrical appliances.

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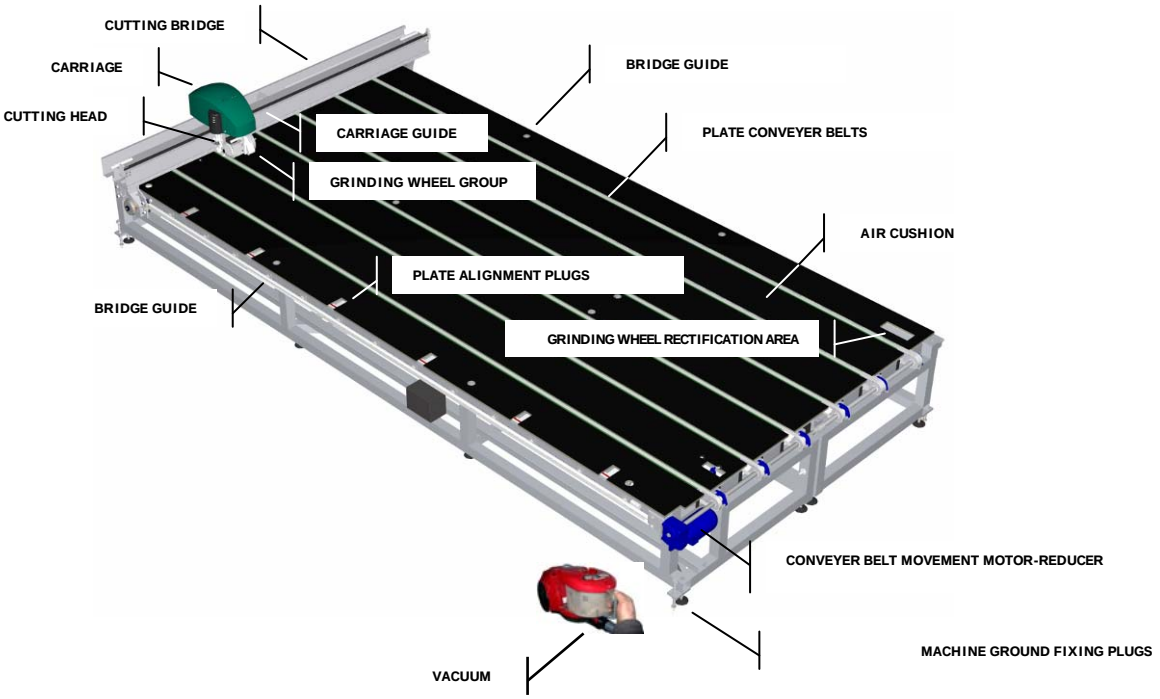
340LMT^{evo} CUTTING TABLE

A-010

Name: 340LMT^{evo} balancing cutting table
Dimensions: Regular and Jumbo

General view



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Machine installation

A-011

The Bottero S.p.A. cutting machines cannot be installed by the client, but only by Bottero S.p.A. highly specialised and authorised personnel.

If no Bottero technicians are present when the machine arrives at the point of installation, the client is only authorised to unload the machine from the transport mean and its storage.

The unloading procedures and the storage conditions are reported in the "Machine Unloading" manual and in the "Specific Techniques" supplied to the client upon purchase.

The general installation procedures of the machines are as follows:

1. Place the machine parts in the zone chosen for assembly and described inside the installation layout.
2. Bring the machines to a horizontal position.
3. Connect the machines among themselves.
4. Adjust the planarity of the line components with an optic millimetric level with a precision equal to ± 1 mm.
5. Carry out the electrical connections as in the electrical design, attached to the documentation provided with the machine.
6. Carry out the pneumatic connections.
7. Install the machine carters.
8. Install the protection barriers which separate the work area.
9. Power the machine electrically and pneumatically.
10. Fix the machine to the ground using expansion plugs.
11. Inspect the operator protection devices following the procedure in the section **D–Access to the operative items, subject: "Periodical safety verification"**
12. Inspect the emergency stop devices. (emergency buttons and extra-run sensors)

Commissioning

A-012

During the installation phase of the machines, a formation course is given for the personnel proposed for the use of the machine or of the line itself, where the procedures are displayed for a correct safe use of the machine supplied.

Upon completion of commissioning, a machine installation and personnel formation report will be signed.

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B

ACCIDENT PREVENTION RULES

SECTION SUMMARY

Foreword _____ B-3
List of risks due to the use of the machine _____ B-4
List of risks due to the maintenance of the machine _____ B-5
List of risks due to glass manufacture _____ B-5
General safety procedures _____ B-6
Individual protection devices _____ B-7

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Foreword

B-001

This instruction manual aims to supply all the information relating to the safety procedures to be adopted during the use and maintenance of the machine and the remaining risks present for the single activities.
The machine is designed and constructed with the intent of eliminating all risks attached to its use.
However, during the normal glass handling cycle and during maintenance, the operators and maintenance are exposed to some remaining risks which, for the nature itself of the operations, cannot be totally eliminated.

The employer must see to it that all personnel are informed of these procedures and that they are adopted by all.

The managers must ensure that all equipment and safety devices present on the machine or on the line or near by, are always used correctly, are not modified, excluded or tampered with.

The machine operators must apply the safety procedures described in this manual and more precisely:

1. Use the provided safety devices correctly and to wear the **IPD** recommended.
2. Do not damage the safety devices.
3. Signal, as soon as possible, to the personnel responsible, any defect found on the machine or in the safety devices, as for example the incorrect assembly of carters or screens.
4. Keep the working place in order and as clean as possible.

This instruction manual must be supplied to each machine operator and to maintenance, so as to know all the notions before accessing the work areas.

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List of risks due to the use of the machine

B-002

The remaining risks attached to the use of the machine are:

LIST OF RISKS	PRESENCE
Mechanical risks	**NO**
Risks due to the electric energy	**NO**
Risks due to the pneumatic energy	**NO**
Risks due to the hydraulic energy	**NO**
Risks of fire	**NO**
Risks of explosion	**NO**
Risks due to vibrations	**NO**
Risks due to radiations	**NO**
Risks due to laser devices	**NO**
Risks due to the emissions of dusts, gas, etc.	**NO**
Risk of getting trapped in a machine	**NO**
Risk of falling	**NO**

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List of risks due to the maintenance of the machine

B-003

The remaining risks attached to maintenance operations are:

LIST OF RISKS	PRESENCE
Mechanical risks	**Consult sections I-L of the manual**
Risks due to the electric energy	**Consult sections I-L of the manual**
Risks due to the pneumatic energy	**Consult sections I-L of the manual**
Risks due to the hydraulic energy	**Consult sections I-L of the manual**
Risks of fire	**NO**
Risks of explosion	**NO**
Risks due to vibrations	**NO**
Risks due to radiations	**NO**
Risks due to laser devices	**NO**
Risks due to the emissions of dusts, gas, etc.	**Consult sections I-L of the manual**
Risk of getting trapped in a machine	**NO**
Risk of falling	**Consult sections I-L of the manual**

List of risks due to glass manufacture

B-004

The risks attached to glass working operations are:

LIST OF RISKS	PRESENCE
Cuts and wounds	▸ **Splinters or pieces of glass.** ▸ **Sharp edges.**
Slips and falls	▸ **Pieces of glass.**
Dusts, fumes and chemical risks	▸ **Dusts generated by the presence of Lucite on glass.**

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General safety procedures

B-005

Preparation of the balancing or fixed cutting tables working area

The fixed or balanced cutting tables are installed and commissioned by specialised personnel and **previously authorised by Bottero S.p.A.**
During installation, physical and photoelectric barriers are mounted on the machine, which prevent accidental contact with the machine moving.

During installation, the machine must be completed by the client, as follows:

- The machine area must be marked with yellow horizontal signals.
- The area must be well lit.
- The machine area must always be kept in order and clean.
- The machine area must be protected from the passage of lift trucks or from any other motorised mean which could cause danger for the operators.
- The machine area must not be crossed by suspended loads except for the glass plates which are loaded onto the cutting machine.
- Near the machine, in an easily reachable and protected position, must be placed all **I**ndividual **P**rotection **D**evices (IPD) for operators and maintenance.
- The electrical and pneumatic connections must be carried out correctly, so that no obstacles or dangers are created for the cutting machine operators.

Safety procedures for cutting table operators

Whoever works on the cutting tables must follow these safety procedures.

- Always use the Individual **P**rotection **D**evices foreseen and described in this instruction manual.
- Always operate in perfect physical conditions.
- Always keep the working area clean and orderly.
- Do not damage the safety equipment, individual protection devices or use them incorrectly.
- Keep the cutting table always clean and efficient.
- Long and loose hair must be protected.
- Pendant, ties, scarves etc. are not to be used during both use and maintenance of the machine.
- It is forbidden to use the machine or the cutting line with damaged or used parts.
- It is absolutely forbidden to use the machine without fixed protections. (e.g. protection carters, photoelectric or mechanical barriers, etc.)
- Any defect on the machine or safety devices must be immediately communicated to the manager. (for example, protection carters or protection panels on the electrical boards, etc.)
- It is forbidden to leave pieces of glass on the machine at the end of the work shift.
- It is forbidden to process plates of broken glass.
- The manufacture of glass, which dimensions exceed the machine, both in thickness and dimensions, is forbidden.
- It is compulsory to test the machine safety daily and, however, at the beginning of every work shift.
- It is compulsory to supervise the machine working area during the work cycle.
- It is forbidden to operate the machine with only the operator present at the work site.

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Individual protection devices

B-006

The use of individual protection systems represents an efficient intervention finalised to contain the risks, avoiding them becoming health damages.

To be efficient, the protection devices must be:

- **Correctly worn.**
- **Used and kept with care.**

It is also a must of the user, to signal to the employer eventual lacking or damages to the protection means assigned. It is possible that the protection devices, even if ergonomical, may cause discomfort or, however, be badly tolerated; these irritations, usually only initial, are not however comparable with the inconveniences or damages to health which may derive from them not being used.

The individual protection devices to be used when working on a cutting machine or on a line are the following:

1. **Accident prevention shoes**
2. **Protective Helmet**
3. **Ear protections (ear plugs or earmuffs in environments with an Leq (A) above 80Db)**
4. **Protective glasses**
5. **Adequate clothing**
6. **Leather or studded apron**
7. **Gloves with forearm protection for gripping the glass**

These have to be chosen depending on the habitat in which one works and the material handled. It is therefore reminded that when handling glass, all individual protection devices must be anti-cut and anti-sliding (ex. leather or studded aprons, gloves with forearm protection for gripping glass, etc.).

NOTE:

We suggest keeping the list of Individual Protection Devices updated, using the best safety at work devices available on the market.

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C

INFORMATIVE LABELS

SECTION SUMMARY

Foreword _____ C-3
MACHINE IDENTIFICATION _____ C-3
Labels _____ C-3
Positions of the certificate labels on the cutting machines _____ C-5
Prohibition _____ C-6
Danger _____ C-8
Obligation _____ C-10
Informative _____ C-11
Symbols used in the manual _____ C-13

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Foreword

C-001

In this section of the use and maintenance manual, all the pictograms present on the machines manufactured by Bottero S.p.A. are reported.
It is the operator's responsibility to identify those placed on his own table purchased and which information represents it.
The purpose of these pictograms is to continuously remind the machine operating personnel, in a clear and immediate manner, of **the obligations and prohibitions** to be respected.

The pictograms also highlight areas of the machine where the remaining risks are.

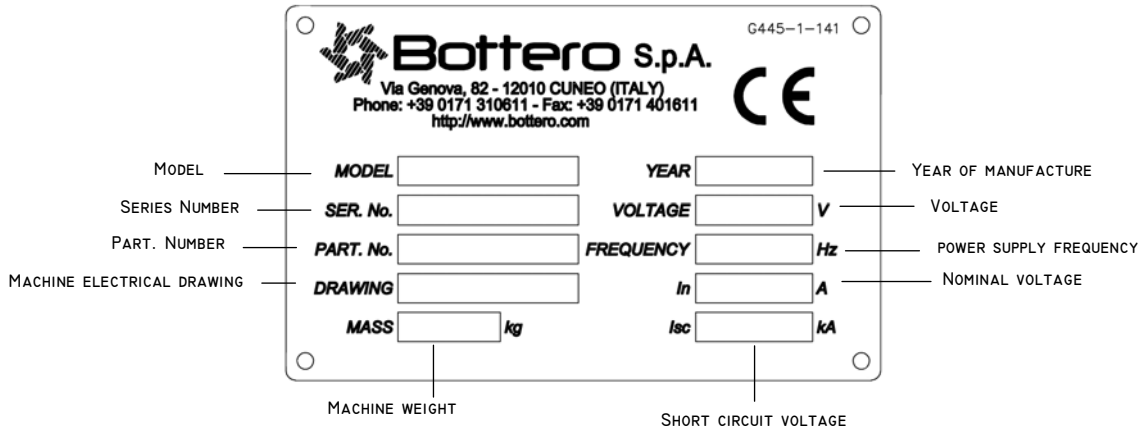
Among the various informative labels on the machines, the certificate labels are present as well.
These carry the essential data of the manufacturer and of the machine.

MACHINE IDENTIFICATION

Labels

C-002

Label placed on the machine electrical board.



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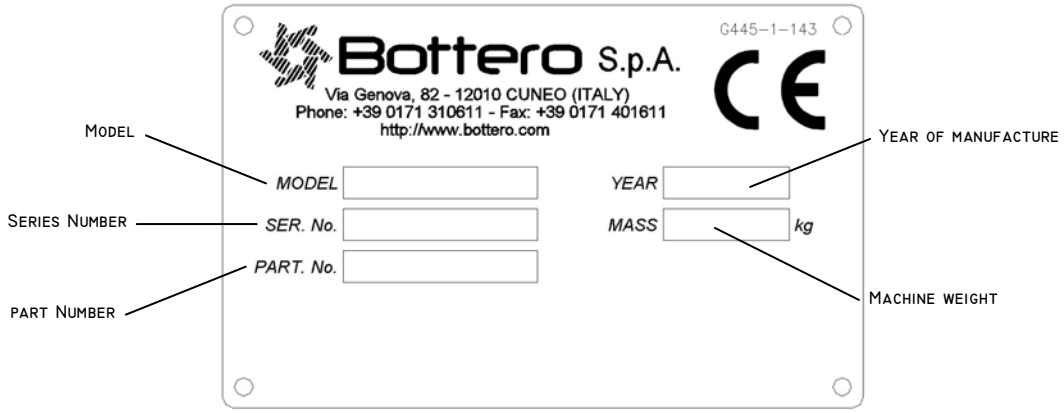
Label placed on the machine frame.



This data has to be given to Bottero S.p.A. when requesting telephone assistance, so that our technician is able to immediately identify the machine for which the assistance is required.
In case of telephone assistance, one must have the following data and material before calling the technical service:

- **Machine model**
- **Series number**
- **Year of construction**

(Present on machine frame label)

- **Electrical drawings**
- **User manual instructions**
- **Spare parts booklet**

(Present in the documentation box)

- **Version of the program installed** (Machine program key F1)

NOTE:

The data on the label must not for any reason be altered.
The label must be clearly legible and is not to be removed, as it represents the necessary conditions for product recognition and, therefore, the application of the warranty conditions.
Please also note that, a precise description of the product will enable our after sales technical assistance service, to give fast and efficient replies.

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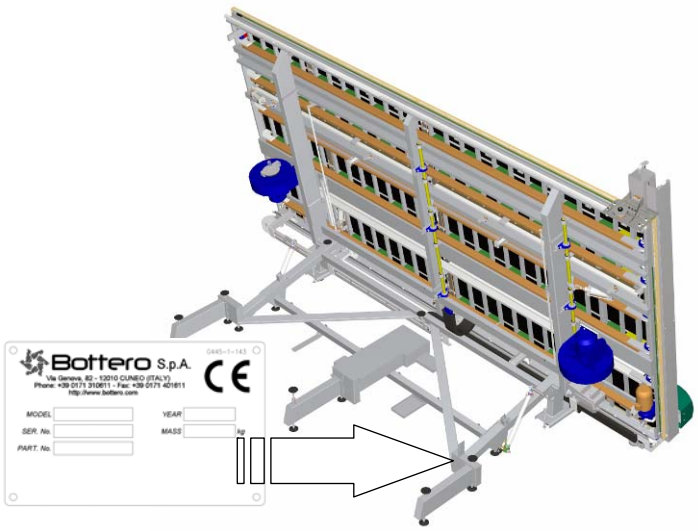
Positions of the certificate labels on the cutting machines

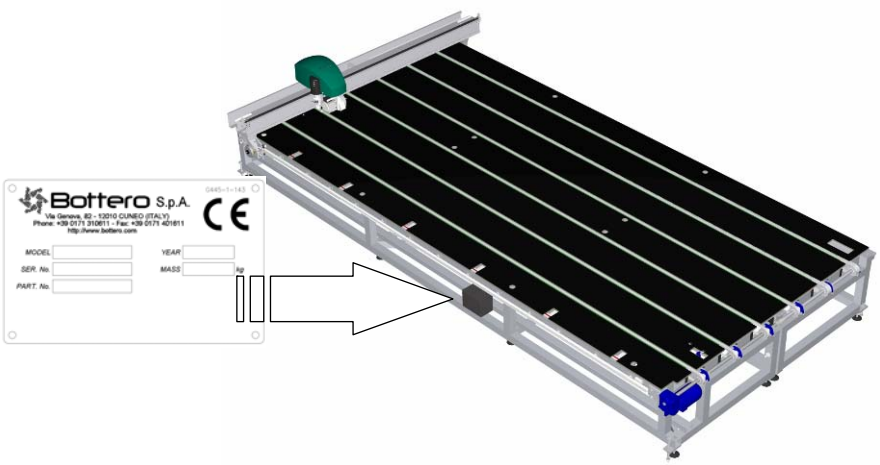
C-004

We view the positions of the certificate labels.

352BCS evo tables
352LMT evo tables



340BCS evo tables
340LMT evo tables



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PICTOGRAM LIST

Prohibition

C-005

It is important that the operator keeps to the specifics dictated by the label, so as to avoid malfunctioning or dangerous conditions.

IT IS FORBIDDEN TO REMOVE THE PROTECTIONS FROM THE MOVING ITEMS.
This label is placed on the carter of the machine so as to remind the operator that it is absolutely forbidden to remove such protections during the machine functioning.
In case of extraordinary maintenance, it is possible to remove such protections, only by technical personnel, previously authorised by Bottero S.p.A. This operation must be carried out with the machine on zero energy.

IT IS FORBIDDEN TO OIL OR CARRY OUT MAINTENANCE ON MOVING ITEMS.
This label reminds the operator that it is absolutely forbidden to oil or carry out any type of maintenance and cleaning of the machine items, whilst these are moving
These operations must be carried out with the machine on zero energy. It is also forbidden to manually move the machine for maintenance, even if the same has already been moved with zero energy; for example, it is forbidden to push the bridge or the trolley for cleaning, unless carried out by authorised and instructed Bottero S.p.A. technical personnel.

NO SMOKING AND USE OF FREE FLAMES ALLOWED.
This label reminds the operator that it is absolutely forbidden to smoke or to use free flames, as there are inflammable liquids or materials near by.
This label is placed on the hydraulic oil and cutting oil tanks or, however, on all inflammable material present on the machine.

STOP ACCESS DENIED.
This label indicates that one is near a reserved and dangerous area in which it is absolutely forbidden to enter.
It must be placed on all safety barrier doors during maintenance and access to these areas.

FORBIDDEN TO MOVE THE PLATES FURTHER THAN THE TABLE SURFACE.
This label reminds the operator that it is absolutely forbidden to move the glass plate out of the cutting or cut running table surface.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

FORBIDDEN TO STAND NEAR THE MACHINE WHILST OPERATING.
This label reminds the operator that it is absolutely forbidden to stand or move around the machine whilst this is operating. In case of maintenance which requires access to areas underneath balancing items, the moving items, with devices installed on the machine, must be secured, as well as securing the same to a bridge crane. These procedures, if necessary, are described in the manual, under the section dedicated to the use of the machine.

INDICATION OF PLATE MAXIMUM HEIGHT.
This label, placed near the unloading arms, indicates the maximum height dimension of the plates to be moved. It is absolutely forbidden to load and unload glass higher than the value indicated on the label.
Attention: the image to the side shows an example of the label indicating the plate maximum height. The quota of 2.4 metres shown is purely for the manual graphic and editorial purpose. Always verify the real maximum height of the movable plate on the label on the machine.

FORBIDDEN TO USE WATER TO PUT OUT FIRES
This label on the electrical control board and on the derivation boxes indicates the prohibition to use water or other liquids in general, to put out fires.
In case of fires, use specific extinguishers with non-conductive powder.

FORBIDDEN TO USE SCARVES OR TIES
This label on the machine indicates the prohibition to use scarves, ties, pendant or nay other item which may result dangerous whilst using the machine.

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Danger

C-006

ATTENTION DANGER SPLINTERS PROJECTION
This label reminds the operator that near by there is an item of the machine which might project splinters whilst operating. Generally, the label is placed near the grinding wheels for emitted "Bacco" glass (Low-E). Please also remember that, in case this danger signal is present, it is compulsory to use body protection screening (face screens, gloves, helmet and adequate clothing).

ATTENTION HOT SURFACE.
This label reminds the operator that near by there is a part of the machine which surface may reach dangerous temperatures in case of direct contact. Generally, the label is placed near the warming resistance. Please also remember that, in case this danger signal is present, it is compulsory to use body protection screening (thermal isolating gloves and adequate clothing).

ATTENTION LASER.
This label reminds the operator that near by there is a laser device. The label is placed near the projectors for the diagonal cut indication on the cutting machine for laminated glass. The operator is also reminded that, in case this danger signal is present, it is absolutely forbidden to carry out maintenance, cleaning and adjustments to the equipment, without prior authorisation on behalf of Bottero S.p.A. **Please also remember that such devices are particularly dangerous and never have to be pointed towards the eyes.**

ATTENTION DANGER LIMB CRUSHING.
This label reminds the operator that near by there is an item of the machine which might crush hands. The label is placed near the traction bridges on the cutting machine for laminated glass. The operator is also reminded that, in case this danger signal is present, it is absolutely forbidden to manually carry out movements of the glass positioned underneath these items. Bottero S.p.A. supplies the specific utensil to carry out glass movement in these areas of the machine.

ATTENTION DANGER ELECTRIC BOARD UNDER VOLTAGE.
This label placed on the electrical control boards and on the derivation boxes, indicates the danger of fulguration caused by the power installed in the circuit. The indication of the voltage refers to the maximum voltage present inside the board on which it is fixed.

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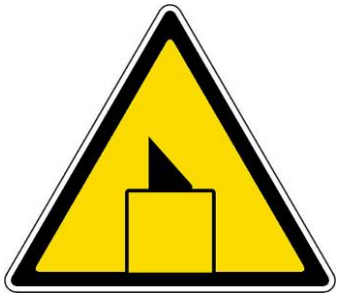
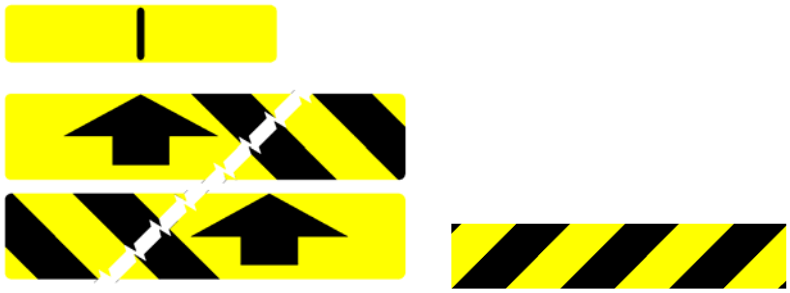


ATTENTION DANGER MOVING UTENSIL.
This label placed on the laminated cut machine, set for the PVB with razor blade cut, indicates the danger caused by the cutting utensil.
It is also important to operate with particular attention when carrying out maintenance or adjustments on this cutting item.

DANGER SUSPENDED LOADS
This label placed on the lifting items, indicates that it is absolutely forbidden to go near and stand underneath suspended loads.
Before using the equipment, it is absolutely necessary to read the sections of the manual dedicated to the use procedure.

ATTENTION AREA, AREAS OR POINTS WITH REMAINING RISKS
These adhesive labels are stuck to highlight and make more visible the areas which contain remaining risks, for example, holes in the floor, areas or items with bumping risks, crushing risk etc.



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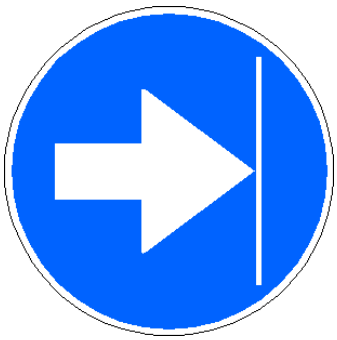
Obligation

C-007

HOOKING OBLIGATION
This label indicates the position in which the lifting items have to be hooked. It is absolutely compulsory to respect the position of the hooking points during the moving phases of the machine and during the maintenance required.



POSITIONING TROLLEY DURING TRANSPORT
This label, placed on the automatic bridge crane tubular, indicates the position to be assumed by the machine trolley during transport.

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Informative

C-008

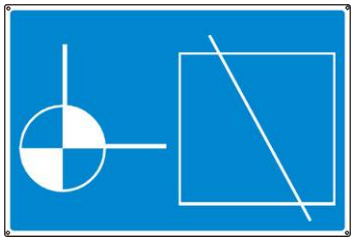


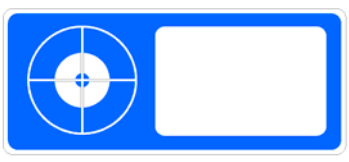
PLATE POSITION FOR DIAGONAL CUT.
This label indicates to the operator the position of the plate on the cutting tables for laminated glass, at the moment in which the diagonal cut is to be carried out.

INDICATION OF MAXIMUM LOAD.
These labels indicate the machine or machine item maximum load in Kg.
It is absolutely forbidden to load and unload glass with a weight which exceeds the value indicated on the label.

INDICATION PNEUMATIC FEEDING DATA.
This label, placed near the pneumatic feeding group, indicates which are the minimum and maximum pressures and the minimum load requested for pneumatic feeding.
Depending on this data, the pneumatic feeding plant will have to be adapted.

CUTTING OIL TANK ON-OFF PRESSURE.
This label, placed near the cutting oil tank, indicates the pressure insertion or emptying in the oil tank.

GLASS DIRECTION.
This label, placed on the side of the table, indicates the direction of the cutting line, that is, the direction of the glass plate whilst moving.



COMPRESSED AIR ATTACHMENT.
This label, placed near the air filter group, indicates the point of pneumatic attachment of one or more machines.

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COMPULSORY EAR PROTECTION.
This label indicates the obligation to use individual acoustic protection devices.

COMPULSORY HAND PROTECTION.
This label indicates the obligation to use hand protection devices.

COMPULSORY EYE PROTECTION.
This label indicates the obligation to use eye protection devices.

COMPULSORY HEAD PROTECTION.
This label indicates the obligation to use head protection devices.

COMPULSORY BODY PROTECTION.
This label indicates the obligation to use protective clothing for the body.

COMPULSORY FOOT PROTECTION.
This label indicates the obligation to use protective shoes.

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Symbols used in the manual

C-009

GENERAL DANGER

Indicates possible danger caused by various factors.

ADDITIONAL NOTE

DANGER OF FALLING

Indicates the possible danger of falling caused by climbing on machinery.

DANGER OF TRIPPING

Indicates a possible danger of tripping due to raised particulars.

TELEPHONE NUMBER of machinery manufacturer.

Pollution **BAN**.

WARNING

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D ACCESS TO MACHINE WORKING AREAS

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Photoelectric barriers D-3
ACCESS TO GLASS LOADING AREAS D-5
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340BCS^{evo} and 340LMT^{evo} cutting tables D-6
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Foreword

D-001

We will describe in this section of the user instruction manual, which operations must be carried out to be able to safely access the machine working areas, the glass loading areas, the maintenance areas and to the operative items of the machines, that is, those items covered by protection carters.

Carter

These protections, mounted on the cutting trolley, on the bridges and on other parts of the machine, protect the operator during the machine cycle phases and protect the maintenance in machinery verification and control phases.

Remember that the safety carters must never be tampered with for any reason.

Metallic barriers

The metallic barriers are made of gratings anchored to the floor by means of support poles. The function of the metallic barriers is to protect the operator from possible accidental contact with the machine or with the glass during its working.

Only when the machine is stopped, with the cutting bridge in the axle zero position, must one access inside of the metallic barriers. When one of the access doors to the working area opens, the machine stops immediately[1].

It is absolutely not allowed to carry out modifications to the barrier or carter installation regarding the original machine equipment and that carried on the sales layout.
In case the habitat does not allow for barrier installation, as in specifics, the technician installing the machine must immediately inform Bottero S.p.A. of the variables and await a new installation layout.
The client, taken note of the amendments, will have to send confirmation of the layout acceptance to Bottero S.p.A.
The moment Bottero S.p.A. receives acceptance of the layout revision, the technician can activate the cutting table.

Photoelectric barriers

Around a 352 BCS^{evo}-LMT^{evo} balancing or fixed cutting machine, photoelectric barriers are placed which protect the operator from machinery movement during the cutting cycle.

Only when the machine is stopped, with the cutting bridge in the axle zero position, must one access this area.

Whenever the band is interrupted during the cutting cycle, the machine will immediately block all its movements[1].

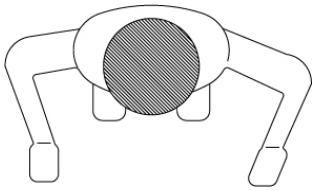
[1] When the machine cycle restarts, it will be repositioned at the stop point, awaiting instructions from the operator.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

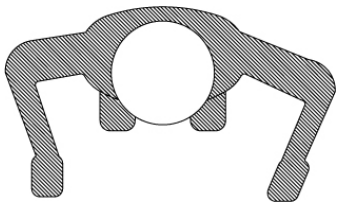
Remember it is absolutely forbidden to modify, tamper with, exclude or dismantle the safety barriers and carters of the machine.

Using a cutting table without safety barriers ~~and~~ without carters can cost a life!

Remember as well that the operator must operate the machine in the position indicated in the installation layout.
This position allows the operator to have visual control of the whole machine or of other machines connected to the same. In the installation layout, the operator position is indicated by the following symbols:



Operator position on commanding pulpit.



Operator position near the glass cut running, load and unload table.

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ACCESS TO GLASS LOADING AREAS

D-002

352 BCS^{evo} and 352 LMT^{evo} cutting tables

To facilitate access inside the **352^{evo} model** machine working area**,** the zone has been separated by photoelectric barriers which protect the operator during the cutting and grinding cycle of the machine.

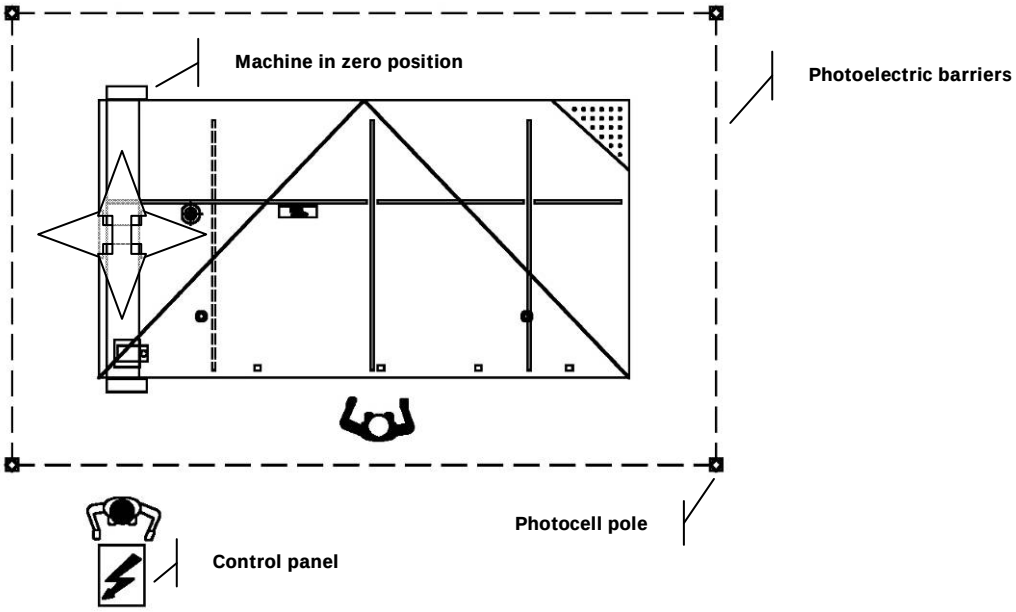
Only when the machine is stopped, with the cutting bridge in the axle zero position, must one access this area.

If during a cutting cycle the photoelectric barrier band should be interrupted, the machine immediately blocks all its movements.

ACCESS TO GLASS LOADING AREA

Operation description

Plate loading must be carried out on a machine without glass, using the adequate lifting items and accessories. Table ascent is carried out pressing the key[2] present on the control panel.



In this example is shown a layout of a 352 BCS^{evo} balancing machine protected on the four sides by photoelectric barriers.

Intervened safety device restoration

The moment the band generated by the photoelectric barriers is interrupted, the cutting table blocks and the intervention of the safety devices is signalled by means of the lit **Intervened Operator Safety** button on the control panel.

To bring the machine back to working conditions one must:

- Make sure that in the working area no personnel is present.
- Press the button displayed here at the side.
- Reset the machine using the key on the control panel[2].

[2] Consult section **F** of this manual.

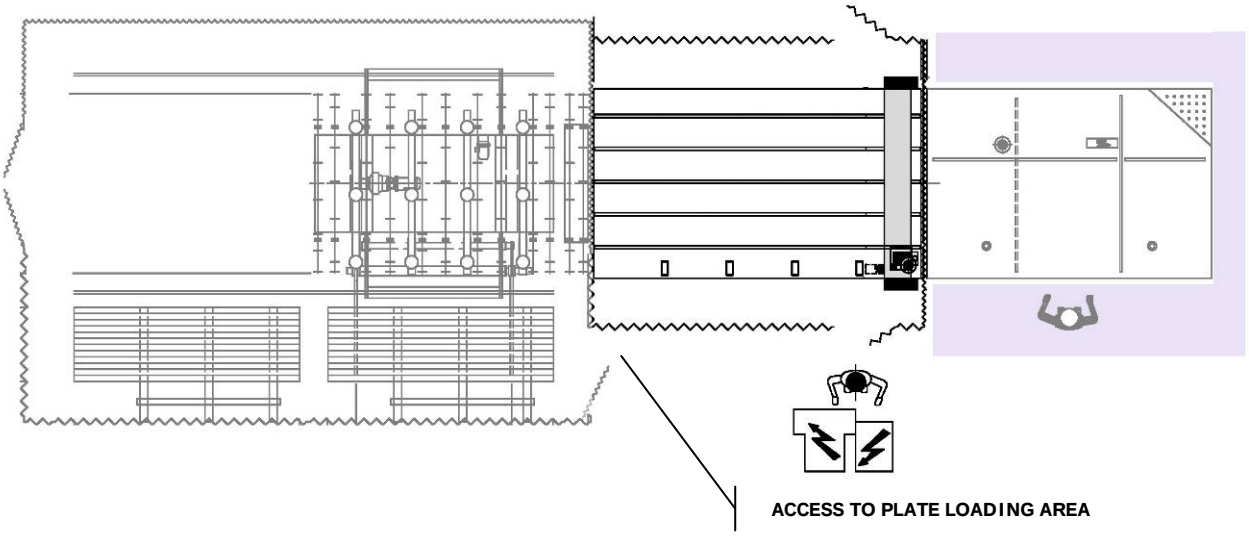
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

340BCS^{evo} and 340LMT^{evo} cutting tables

Plate loading in automatic mode

Plate loading on the cutting machine is done in automatic mode with the plate loading and transport function by means of the conveyer belts inserted in the base of the isolator.
For the first load, it is sufficient to press the TRANSPORT key placed on the control panel[3].

EXAMPLE OF 340 BCS^{evo} TABLE COUPLED WITH LOADING DEVICE AND MANUAL CUT RUNNING TABLE.



[3] Consult section **F** of this manual.

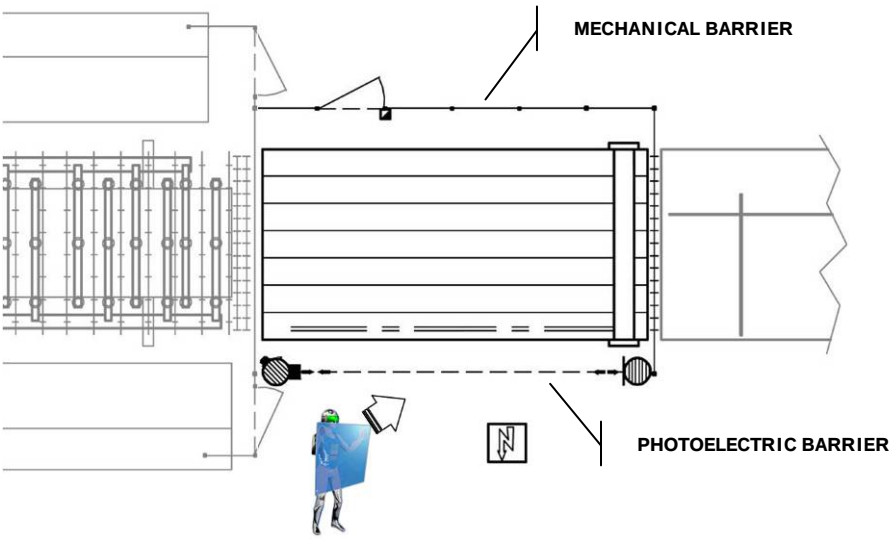
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Manual loading of a beam

Access to the **340 model**[evo] machine glass loading area is possible only in the configuration with metallic and photoelectric barriers as displayed in the layout below.

Only when the machine is stopped and the axle zero position, must one access this area going beyond the photoelectric barrier.

The beam volume must not be less than the minimum dimensions described in the machine specifics and its movement must be carried out complying with safety laws.



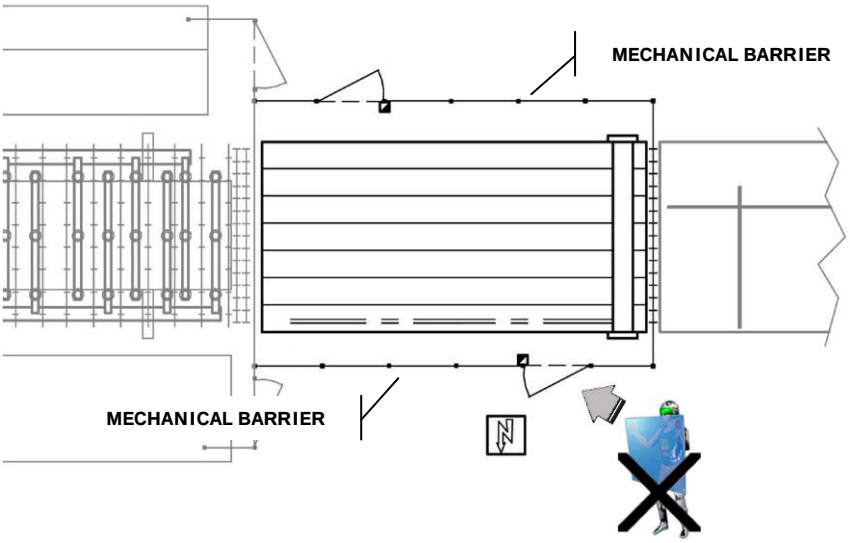
Intervened safety device restoration

The moment the band generated by the photoelectric barriers is interrupted, the cutting table blocks and the intervention of the safety devices is signalled by means of the lit **Intervened Operator Safety** button on the control panel.

To bring the machine back to working conditions one must:

- Make sure that in the working area no personnel is present.
- Press the button displayed here at the side.
- Reset the machine using the key on the control panel[4].

Manual loading of a beam is not possible with this line configuration.



Loading will be possible only using the loading device and in automatic mode.

[4] Consult section **F** of this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

ACCESS TO GLASS CUT RUNNING AREAS

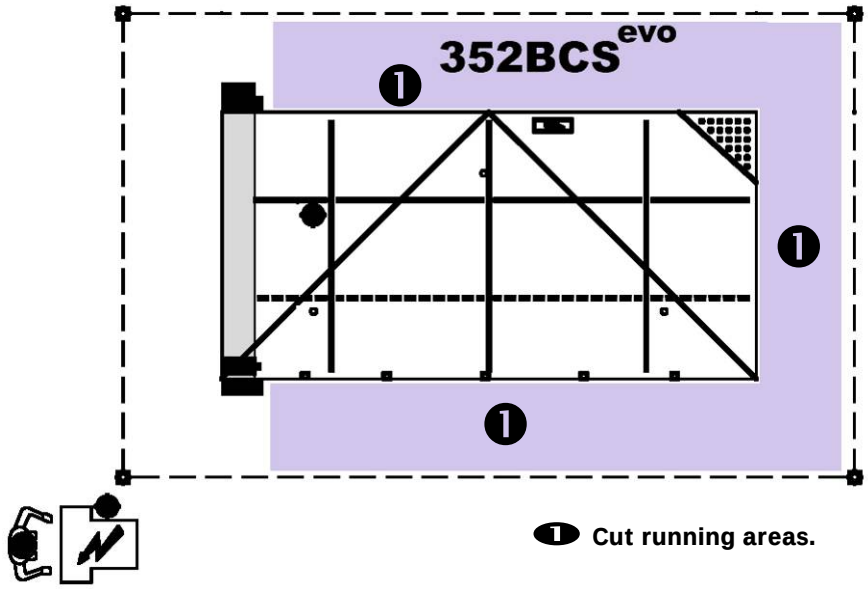
D-003

352 BCS^{evo} and 352 LMT^{evo} cutting tables

Access to the cutting machine cut running area is possible only with the machines supplied with photoelectric perimetrical barriers.

Only when the machine is stopped and the axle zero position, must one access this area.

In this example is shown a layout of a jumbo balancing machine protected on the four sides by photoelectric barriers.



1 Cut running areas.

ACCESS TO GLASS CUT RUNNING AREA

Operation description

When the machine has finished its cutting cycle, and therefore stopped and in the zero position, enter inside the photoelectric barriers.

The cut running operations will be carried out following sequence:

1. Fan start-up using the pedal on the ground.
2. Plate movement, by means of the air cushion.
3. Positioning of the incision at the centre of the run cutting bar.
4. Cut running bar ascent by means of the pedal on the ground corresponding to the bar itself.
5. Unloading of finished piece.

Intervened safety device restoration

The moment the band generated by the photoelectric barriers is interrupted, the cutting table blocks and the intervention of the safety devices is signalled by means of the lit **Intervened Operator Safety** button on the control panel.

To bring the machine back to working conditions one must:

- Make sure that in the working area no personnel is present.
- Press the button displayed here at the side.
- Reset the machine using the key on the control panel[2].

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

340 BCS^{evo} and 340 LMT^{evo} cutting tables

On this type of cutting tables, glass cut running is possible only if equipped with the air cushion + cut running bars optionals and the perimeter protected with photoelectric barriers (figure 1).
In the most common cutting line situation, as shown in figure 2, the cut running area is separated from the cutting area and is without barriers.

When the machine has finished its cutting cycle, and therefore stopped and in the zero position, the operator calls the glass plate using the button placed on the cut running table push button control unit. The plate will be transported by the conveyer belts on the manual cut running table.
The operator must wear all the necessary **IPD** [5] and, using the fan ON-OFF buttons, he must stop the plate on the cut running table. Still using the air cushion the operator must position the incision in correspondence with the cut running bar and by means of the pedal button placed on the ground next to the bar itself, carry out the incision opening.

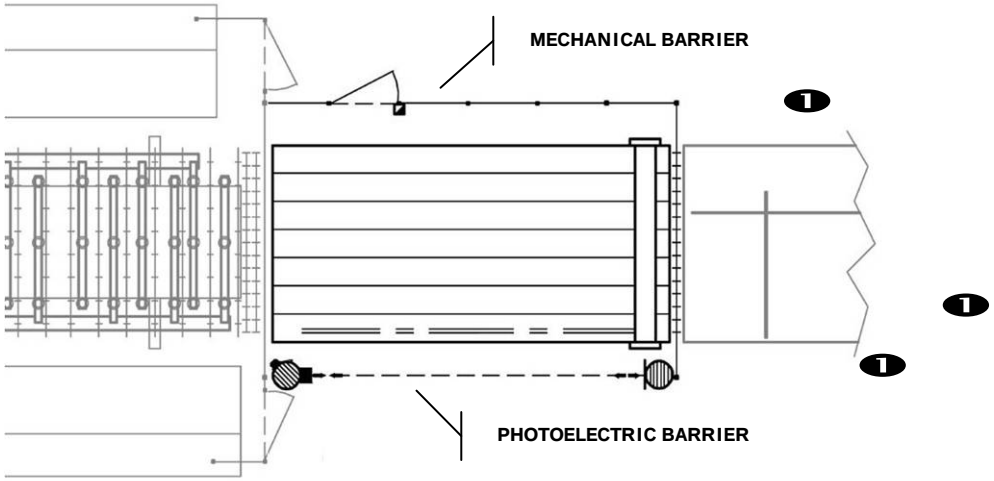


Figure 1

1 **Cut running areas.**

THE LAYOUT SHOWS A CUTTING LINE WITH A LOADING DEVICE AND A MANUAL CUT RUNNING TABLE.

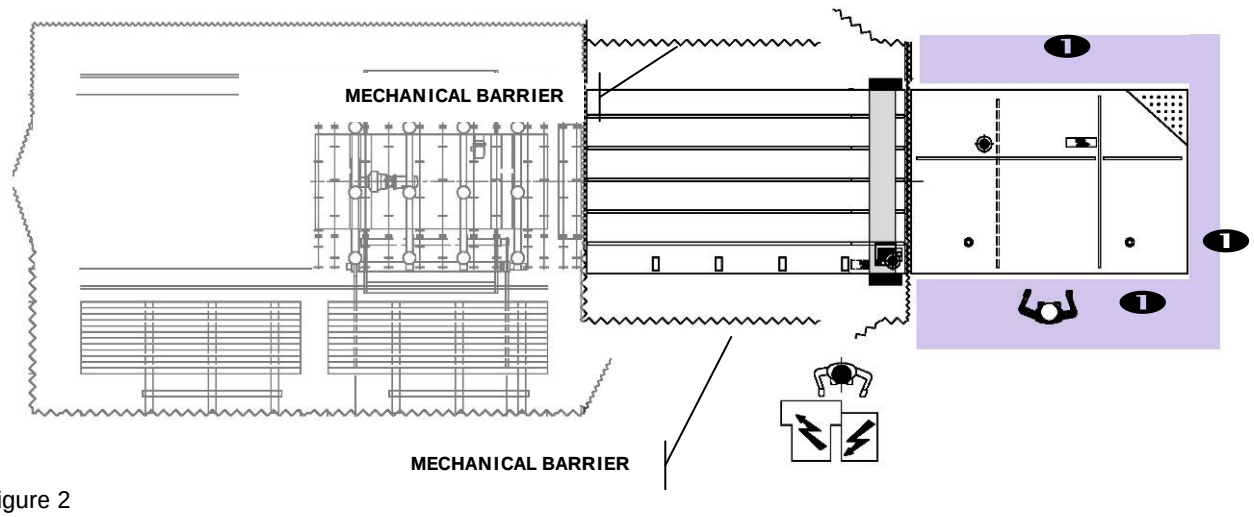


Figure 2

[5] Consult section **B** of this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

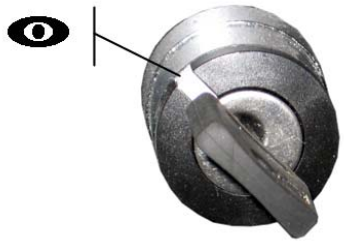
ACCESS TO WORKING AREAS FOR UTENSIL REPLACEMENT

D-007

For your safety, every time you operate on the machine to replace the small cutting wheel, the plastic incision utensil or the grinding wheel to remove the low emissive, it is compulsory to make sure no one can insert pneumatic and electrical energy to the machine.

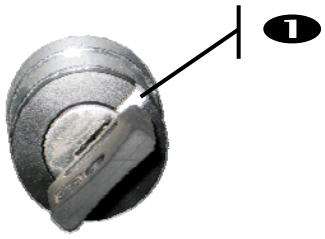
OPERATION DESCRIPTION

- Bring the key selector placed on the control panel into position. ⓪
- **Take the key out and keep it with oneself for the whole time of the operation** so that no one else can start the machine.
- **Exclude the pneumatic energy** acting on the general air regulator placed on the side of the electrical control board, operations described in section **E-exclusion-restoration of energy.**
- Enter the machine working area and go to the cutting head.
- Replace the utensil **following the instructions described in the subject** "Small cutting head replacement", or "Plastic incision utensil replacement" or "Grinding wheel replacement" see section **G** of this manual.
- Having finished the replacement, leave the machine working area.



To be able to use the machine again, it is necessary to:

- **Ensure is no personnel is inside the working area.**
- Restore the pneumatic energy acting on the general air regulator placed on the side of the electrical control board, operations described in section **E-exclusion-restoration of energy.**
- **Insert the maintenance selector key** placed on the control panel and bring it back to the working position. ❶
- Reset the safety circuit by pushing the restoration button. ❷
- Reset the machine using the key on the control panel. ❸
- Carry out a lubrication purging[6]when replacing a utensil.
- Check the cutting pressure for the new utensil.



[6] **Key F10 of the main program display.**

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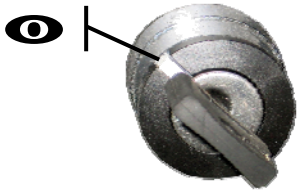
ACCESS TO MAINTENANCE AREAS

D-008

For your safety, every time you operate on the machine or nearby it for a prolonged time to carry out maintenance, it is compulsory to make sure that no one can insert pneumatic and electrical energy to the machine.

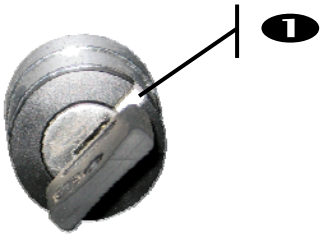
OPERATION DESCRIPTION

- Bring the key selector placed on the control panel into position. ⓪
- **Take the key out and keep it with oneself for the whole time of the operation** so that no one else can start the machine.
- **Exclude the pneumatic energy** acting on the general air regulator placed on the side of the electrical control board and exclude electrical energy, described in section **E-exclusion-restoration of energy.**
- Enter the maintenance area.
- Carry out maintenance or machinery check.
- Having finished the replacement, leave the machine working area.



To be able to use the machine again, it is necessary to:

- Ensure is no personnel is inside the maintenance and working area.
- Restore the pneumatic energy acting on the general air regulator placed on the side of the electrical control board and insert electrical energy, operations described in section **E-exclusion-restoration of energy.**
- **Insert the maintenance selector key** placed on the control panel and bring it back to the working position. ❶
- Reset the safety circuit by pushing the restoration button. ❷
- Reset the machine using the key on the control panel. ❸



Important:

Maintenance carried out underneath a balancing table requires the OBLIGATION to insert the safety tips.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Insertion of safety tips on balancing tables

D-009

Estimated operation time'10 minutes.

This operation requires the presence of at least three people, two to centre the tips and one to control the ascent and descent of the cutting table.

PREPARATION OF THE MACHINE

When you operate on the machine to insert the safety tips, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To lift the table.

REMAINING RISKS

Bumping the table carpentry.

Individual protection devices to be used:

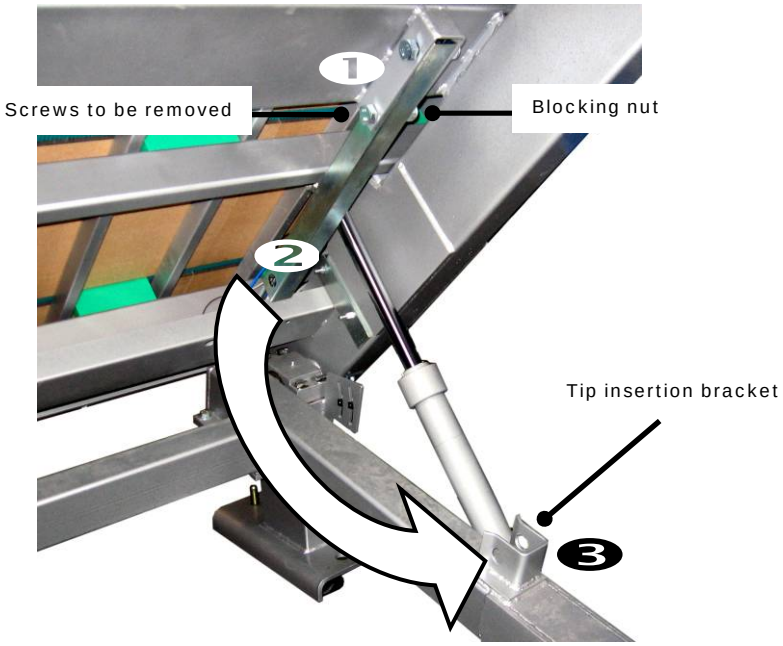
- Protective helmet.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Remove the lower ❶ fixing screws of the two tips to the table.
- Lower the tips ❷ and incline them in correspondence with the bracket ❸ welded to the table base.
- Adjust the inclination[7] of the table so as to centre the tip hole with the bracket hole.
- Insert the screws previously removed in the bracket holes and tighten the blocking nuts.
- Having finished inserting the tips, leave the table working area and **remove pneumatic and electrical energy from the machine.**[8]



[7] Use the keys on the control panel.

[8] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Periodical safety verification

D-010

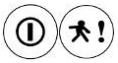
Safety devices must be checked daily or, in any case, at the beginning of every work shift.

This simple and fast testing operation allows verifying the correct functioning of the safety devices.
Remember that electric, electronic and mechanical devices which form part of the safety devices, when not working due to an internal fault, block the machine and prevent all movements.

Whenever during a periodical verification they do not intervene, it means that they have been tampered with or excluded.

Verify photoelectric barriers

To carry out testing on the photoelectric barriers, it is sufficient to proceed as follows:



- Switch on the machine following the procedure described in the following manual.
- Reset the emergency circuit and restore the operator safety circuit by pushing the lit **Intervened Operator Safety** button
- Carry out a simulated cutting cycle and interrupt the photocell band by crossing it.
- Exit the working area.
- Ensure there is no one inside the working area.
- Ensure the lit **Intervened Operator Safety button is on.**
- Carry out a resetting cycle of the machine and ensure that **there are no movements.**

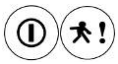
Photoelectric barrier restoration

To bring the machine back to working conditions one must:

- Make sure that in the working area no personnel is present.
- Press the button displayed at the side.

Emergency verification

To carry out a test of the emergencies present on the control panel and on the cutting line push button control units it is sufficient to proceed as described hereafter:



- Switch on the machine following the procedure described in the following manual.
- Reset the emergency circuit and restore the operator safety circuit by pushing the lit **Intervened Emergency and Operator Safety** buttons

For each emergency button present on the line carry out the following operations:

- Press the emergency button. (the button must remain blocked in the low position)
- Check that the **Intervened Emergency** lamp turns on.
- Reset the machine. (the machine must not move)
- Unblock the emergency button by unhooking the mushroom button rotating it in the direction indicated by the arrow on the button.
- Reset the emergency circuit by pushing the lit button.
- Bring the machine back to the zero position. (the machine moves)

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E EXCLUSION-RESTORATION OF ENERGY

SECTION SUMMARY

Machine ignition E-3
Machine switch-off E-3
Electric energy exclusion for machine maintenance E-4
Electric energy restoration after machine maintenance E-5

Start-up and shutdown on MACHINES WITH THE OPTIONAL POWER PACK E-6

Machine start-up with the optional Power Pack E-6
Machine shutdown with the optional Power Pack E-7
Electric energy exclusion for machine maintenance with the optional Power Pack E-8
Restoring electric energy after machine maintenance with the optional Power Pack E-9
Excluding pneumatic energy E-10
Pneumatic energy restoration E-11
Cutting oil tank pressure exclusion E-11
Pressure regulation pneumatic system E-12
Restoring incorrect regulation E-12
Rated, minimum and maximum pressure values table E-12

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Machine ignition

E-000

In order to switch on the cutting machine it is necessary to:

- Reach the back part of the electrical control board.
- Act on the isolator switch located on the electrical control board rotating it clockwise and **bring it to the 1 On position**.
- Power the electrical circuit pressing the ignition key found in the front part of the electrical control board.
- Wait for the operating system to start-up and for the main Windows screen to appear on the display.
- **Click on the BCMSWIN icon** and wait for the software to display the Bottero program interface.
- Restore intervened safety keys.
- Reset the machine using the axis return key.

Isolator in position "1 On"
Machine power supplied.

Machine switch-off

E-001

In order to switch off the cutting machine correctly one must:

- Wait for the machine to complete current cycle.
- Switch off the electrical circuits by pressing the off switch found on the electrical control board.
- Exit the machine's software program by **pressing Alt+X** then confirm, as requested by the program.
- Turn off the personal computer exiting the operating system by clicking on start.
- Reach the back part of the electrical control board.
- Rotate the isolator switch manoeuvre handle counter clockwise and **bringing it to the 0 Off position.**

Isolator in position "0 Off"
Machine not power supplied.

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Electric energy exclusion for machine maintenance

E-002

Whenever one must carry out maintenance, replacement or regulations on the machine, it is always compulsory to exclude the electrical and pneumatic power supplies.

ANY INTERVENTION ON THE MACHINE MUST ALWAYS BE CARRIED OUT WITH THE MACHINE AT ZERO ENERGY.

In order to exclude electrical power during the maintenance phases one must:

- Wait for the machine to complete current cycle.
- Switch off the electrical circuits by pressing the off switch found on the electrical control board.
- Exit the machine's software program by **pressing Alt+X** then confirm, as requested by the program.
- Turn off the personal computer by exiting from the operating system.
- Reach the back part of the electrical control board.
- Rotate the isolator switch manoeuvre handle counter clockwise and bring **it to the 0 Off position.**
- Press the block lever on the manoeuvre handle and insert the safety lock provided with the machine.
- Remove the keys from the lock and place them in a pocket.

Isolator in position "0 Off"

Machine not power supplied.

The moment the electrical energy is excluded, for any maintenance, the safety lock provided with the machine must always be inserted on the isolator switch manoeuvre handle, so as to avoid that other personnel may supply power to the machine during maintenance operations.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Electric energy restoration after machine maintenance

E-003

In order to restore electric power after maintenance one must:

- Reach the back part of the electrical control board.
- Remove the safety lock inserted in the manoeuvre handle.
- Act on the isolator switch located on the electrical control board pressing the white part and turning anti-clockwise and **bringing it to position 1 On**.
- Switch on the electrical circuit pressing the ignition key found in the front part of the electrical control board.
- Wait for the operating system to start-up and for the main Windows screen to appear on the display.
- **Click on the BCMSWIN icon** and wait for the software to display the Bottero program interface.
- Restore intervened safety keys.

Isolator in position "1 On"
Machine power supplied.

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START-UP AND SHUTDOWN ON MACHINES WITH THE OPTIONAL POWER PACK

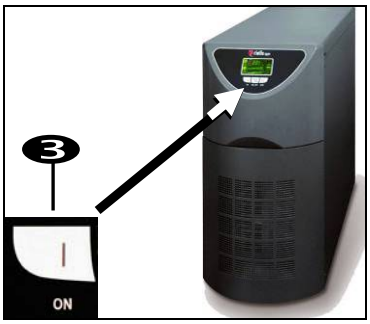
The start-up and shutdown procedures with the OPTIONAL POWER PACK must be carried out following the instruction contained in the following pages.

Machine start-up with the optional Power Pack

E-004

In order to switch on the cutting machine it is necessary to:

- Reach the back part of the electrical control board.
- ❶ Rotate the isolator switch located on the electrical control clockwise, **bringing it to the 1 On** position.
- Reach the uninterruptible power supply[1], located on the ground.
- ❷ Bring the main switch, located behind the uninterruptible power supply, to the "**1**" position.
- ❸ Press the **ON** key for at least 3 seconds on the UPS located in the front part of the uninterruptible power supply.
- Power the electrical circuit pressing the ignition key found in the front part of the electrical control board.
- Wait for the operating system to start-up and for the main Windows screen to appear on the display.
- **Click on the BCMSWIN icon** and wait for the software to display the Bottero program interface.
- Restore the reset key.
- Reset the machine using the axis return key.



PRACTICAL SUGGESTIONS FOR CORRECTLY MANAGING THE BATTERIES.

1. **Discharging the UPS batteries every 4-6 months is recommended. To complete this operation one must disconnect the machine from the company electric network, with the cutting table stopped in the zero position, simulating a loss of power.**
2. **Once the empty batteries signal has been sent, with the cutting table in the zero position, restore power connecting it to the company network.**

A reminder that the necessary time for recharging with the machine switched off is 6-8 hours.

For additional information on the use of the uninterruptible power supply we recommend browsing the manual supplied with the product.

[1] **The uninterruptible power supply** (also know as **UPS**) is equipment that is used to maintain continual power supply to electrical appliances.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Machine shutdown with the optional Power Pack

E-005

In order to switch off the cutting machine correctly one must:

- Wait for the machine to complete current cycle.
- Switch off the electrical circuits by pressing the off switch found on the electrical control board.
- Exit the machine's software program by **pressing Alt+X** then confirm, as requested by the program.
- Close the RTX screen on the display.
- Turn off the personal computer exiting the operating system by clicking on start.
- Reach the back part of the electrical control board.
- ❶ Rotate the isolator switch manoeuvre handle counter clockwise and **bring it to the 0 Off position.**
- Reach the uninterruptible power supply, located on the ground.
- ❷ Bring the main switch, located behind the uninterruptible power supply, to the "**0**" position.

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Electric energy exclusion for machine maintenance with the optional Power Pack

E-006

Whenever one must carry out maintenance, replacement or regulations on the machine, it is always compulsory to exclude the electrical and pneumatic power supplies.

ANY INTERVENTION ON THE MACHINE MUST ALWAYS BE CARRIED OUT WITH THE MACHINE AT ZERO ENERGY.

In order to correctly exclude electric energy from the cutting machine one must:

- Wait for the machine to complete current cycle.
- Switch off the electrical circuits by pressing the off switch found on the electrical control board.
- Exit the machine's software program by **pressing Alt+X** then confirm, as requested by the program.
- Close the RTX screen on the display.
- Turn off the personal computer exiting the operating system by clicking on start.
- Reach the back part of the electrical control board.
- ❶ Rotate the isolator switch manoeuvre handle counter clockwise and **bring it to the 0 Off position.**
- ❷ Press the block lever on the manoeuvre handle and insert the safety lock provided with the machine.
- Remove the keys from the lock and place them in a pocket.
- Reach the uninterruptible power supply, located on the ground.
- ❸ Bring the main switch, located behind the uninterruptible power supply, to the "**0**" position.

The moment the electrical energy is excluded, for any maintenance, the safety lock provided with the machine must always be inserted on the isolator switch manoeuvre handle, so as to avoid that other personnel may supply power to the machine during maintenance operations.

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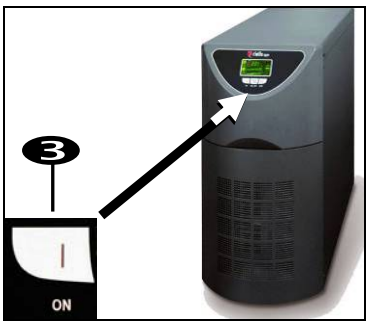
Restoring electric energy after machine maintenance with the optional Power Pack

E-007

In order to restore electric power after maintenance one must:

- Reach the back part of the electrical control board.
- ❶ Remove the safety lock inserted in the manoeuvre handle.
- Act on the isolator switch located on the electrical control board pressing the white part and turning anti-clockwise and **bringing it to position 1 On**.
- ❷ Bring the main switch, located behind the uninterruptible power supply, to the "**1**" position.
- ❸ Press the **ON** key for at least 3 seconds on the UPS located in the front part of the uninterruptible power supply.
- Power the electrical circuit pressing the ignition key found in the front part of the electrical control board.
- Wait for the operating system to start-up and for the main Windows screen to appear on the display.
- **Click on the BCMSWIN icon** and wait for the software to display the Bottero program interface.
- Restore the reset key.
- Reset the machine using the axis return key.



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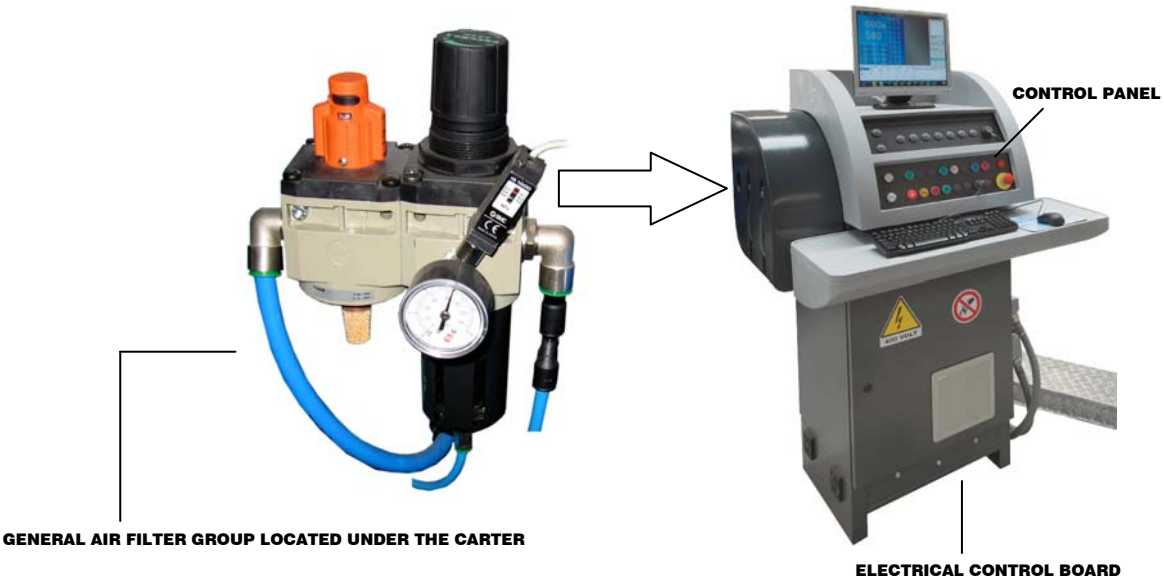
Excluding pneumatic energy

E-008



To be able to exclude pneumatic energy from the cutting table system, it is necessary to open the carter placed on one side of the electrical control board. Identify the air group and then turn the orange lever mounted before the general pressure regulator ❶ situated on the left of the regulator.

When pneumatic energy is excluded **it is compulsory to check that the manometer indicates zero pressure**, once verified, **insert the appropriate lock** ❷ in the hole of the lock valve and close it.
Once the operation is finished, close the protection carter pushing it to run end.

Remember that the lock keys must be kept by the maintenance personnel.

KEYS KEPT BY MAINTENANCE TECHNICIAN

IMPORTANT:

Remember that, despite unloading the plant through the above operations, the machine shows in some of its parts residual store of pneumatic energy. (Low-e grinding wheel ascent-descent cylinder)

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Pneumatic energy restoration

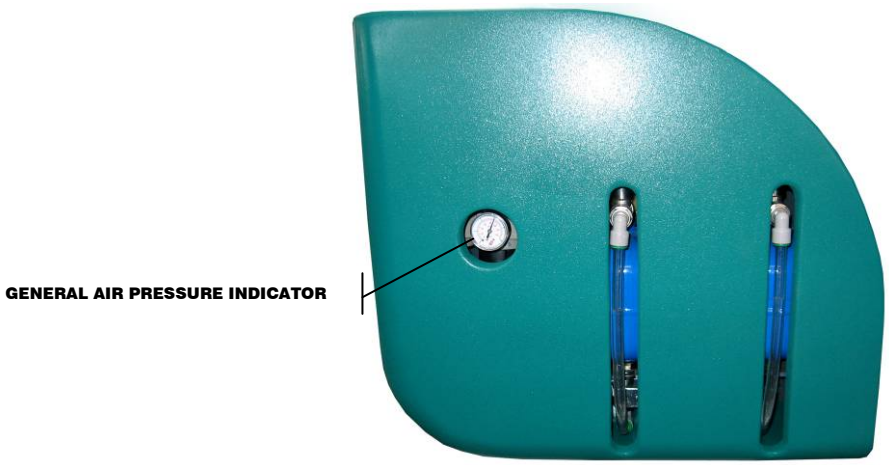
E-009

To be able to restore pneumatic energy to the cutting table system, it is necessary to open the carter placed on one side of the electrical control board. Identify the air group, **remove the protection lock from the general air regulator and lift the red lever mounted before the regulator.**
Once the operation is finished, close the protection carter pushing it to run end.

Cutting oil tank pressure exclusion

E-010

Excluding pneumatic energy from the general air group, we unload the pressure inside the oil tanks.



Before carrying out a top-up or maintenance, check that the manometer shows zero.

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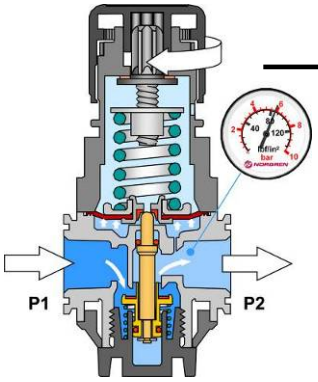
Pressure regulation pneumatic system

E-011

To regulate the general pressure of the compressed air system, it is sufficient to turn the pressure regulator knob mounted on the pneumatic supply group placed inside the carter on the machine control pulpit.
In order to correctly regulate, it is necessary to start with the regulator on zero and increase the pressure until the rated value of **6 bar [Psi 87]** is reached.



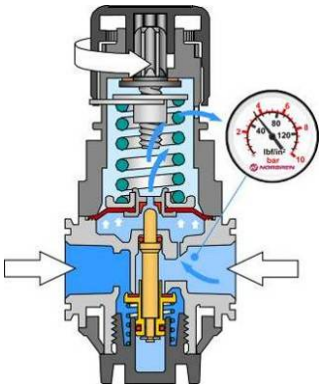
Rotate clockwise

P1 = general pressure of the feeding line.
P2 = pressure to the machine.

Restoring incorrect regulation

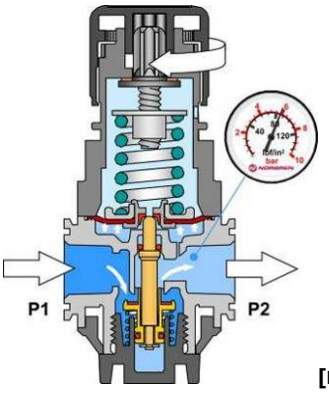
E-012

If the rated value of **6 bar [Psi 87]** is exceeded during pneumatic feeding regulation, operate as follows:



[Psi 58]

1. Rotate the regulator counter clock wise until the system pressure reaches a value that is less than **4 bar.**



[Psi 94.2]

2. Rotate the regulator clock wise until system pressure reaches the rated value of **6.5 bar.**

Rated, minimum and maximum pressure values table

E-013

P1 Machine plant pressure		Minimum	Maximum	Rated
	Bar	6	7	6,5
	Psi	***87***	***101.5***	***94.2***

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F

KEYS AND BUTTONS

SECTION SUMMARY

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Keys on control panel _____ F-3
352BCS^{evo} and 352LMT^{evo} fixed and balancing cutting tables _____ F-4
340BCS^{evo} and 340LMT^{evo} fixed cutting tables _____ F-5

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Foreword

F-001

In this section of the manual all keys and buttons present on the control panel of the electrical control board are described.

Keys on control panel

F-002

On the electrical control board of the various cutting tables, there is a panel with a series of buttons which make the cutting table carry out movements. On the following pages we will describe their functions.

This USB connector is used when importing or exporting files form the BCMSV program using a Pen Drive.

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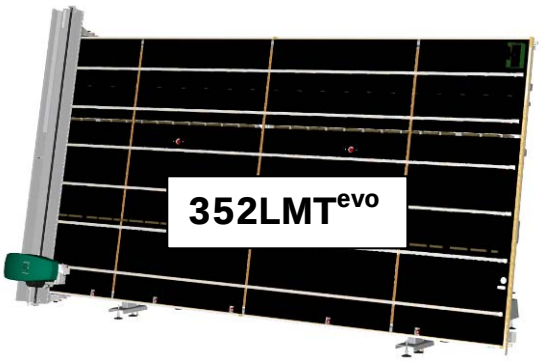
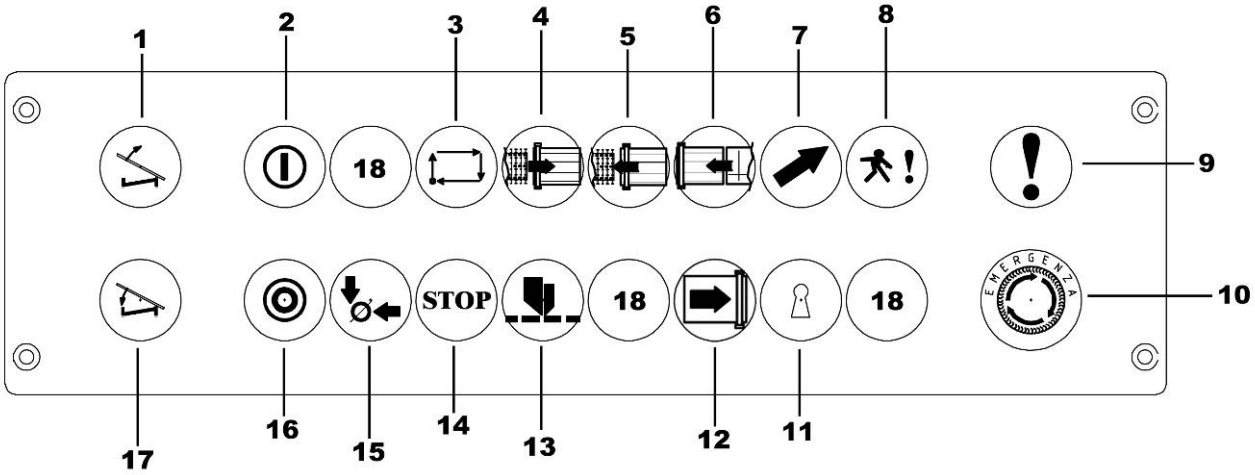
352BCS^{evo} and 352LMT^{evo} fixed and balancing cutting tables

F-003





1	Panel ascent [Optional]
2	Machine ignition
3	Automatic Cycle
4	Plate loading cycle [Optional]
5	Conveyer belts on loading device reverse rotation [Optional]
6	Pedal enabling for conveyer belts reverse rotation from cut running to cutting table [Optional]
7	Restore extra-run
8	Intervened operator safety
9	Emergency lamp inserted

10	Emergency button
11	Machine maintenance
12	Free table
13	Cycle Button
14	Stop cutting cycle
15	Bridge return to zero
16	Machine switch-off
17	Panel descent [Optional]
18	Key not used

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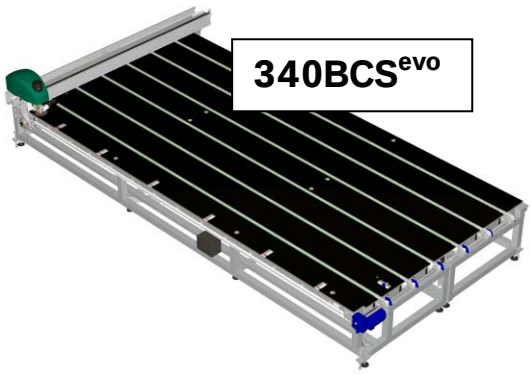
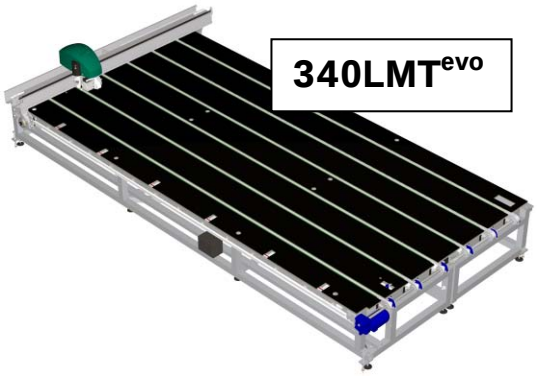
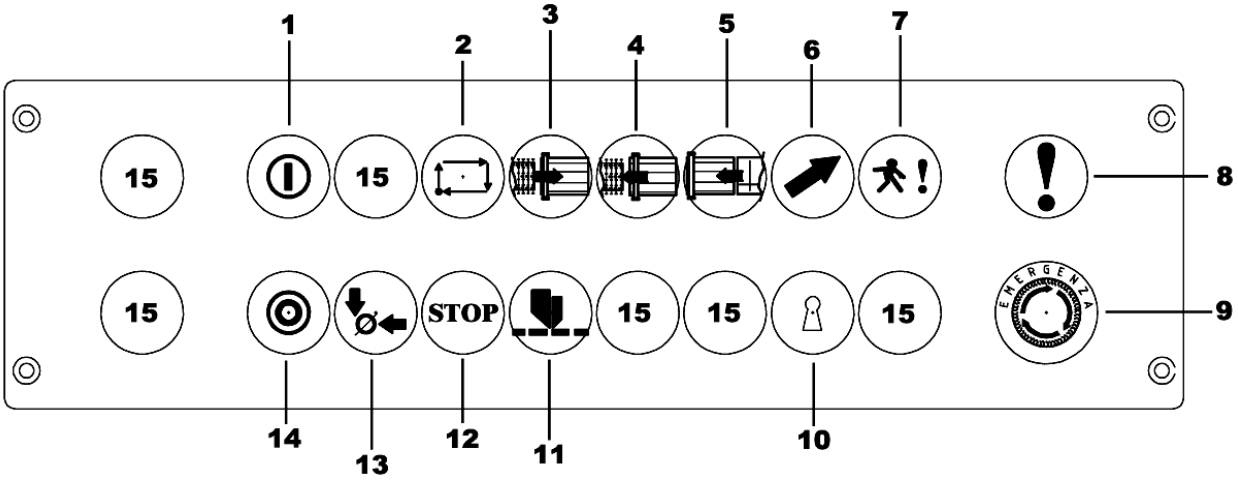
340BCS^{evo} and 340LMT^{evo} fixed cutting tables

F-004







1	Machine ignition
2	Automatic Cycle
3	Plate loading cycle [Optional on 340BCS^{evo}]
4	Conveyer belts on loading device reverse rotation [Optional on 340Bcs^{evo}]
5	Pedal enabling for conveyer belts reverse rotation from cut running to cutting table [Optional on 340BCS^{evo}]
6	Restore extra-run
7	Intervened operator safety
8	Emergency lamp inserted
9	Emergency button
10	Machine maintenance
11	Cycle Button
12	Stop cutting cycle
13	Bridge return to zero
14	Machine switch-off
15	Key not used

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G

CUTTING TABLE USE

SECTION SUMMARY

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Switching the machine on ____ G-3
Switching the machine off ____ G-3

EMERGENCY STOP ____ G-3

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Balancing or fixed cutting tables 352BCS^{evo} and 352LMT^{evo} ____ G-4
Fixed cutting tables 340BCS^{evo} and 340LMT^{evo} ____ G-4

CUTTING DATA INSERTION ____ G-5

CUTTING CYCLE ____ G-5

GRINDING CYCLE ____ G-5

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Replacement of cutting wheel on head with low emissive removal grinding wheel optional G-8
Replacement of the grinding wheel on 352LMT^{evo} and 340LMT^{evo} cutting tables ____ G-9
Grinding wheel replacement on cutting tables with Easy Deletion optional ____ G-10

CUTTING LUBRICATION ____ G-11
Cutting lubrication regulation ____ G-11
Cutting lubrication leak check ____ G-12
Cutting lubrication purge ____ G-13
Cutting lubrication oil tank top-up ____ G-14
Double lubrication selection ____ G-15
Exclusion of lubrication from the incision ____ G-16

CUTTING OF VINYL ____ G-17
Expulsion of cutting wheel ____ G-18
Insertion of plastic incision utensil ____ G-18

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MANUAL CONTROLS ____ G-20
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Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Foreword

G-001

This section of the manual describes the operations to be carried out to work with Evo model machines managed by the Bottero BCMSWin program.
Remember also that cutting machines cannot be used in habitats with explosion risks.
(Refer to directive ATEX 94/9/CE)

SWITCHING THE MACHINE ON AND OFF

G-002

Switching the machine on

To correctly turn the cutting machine on, it is necessary to carry out the following operations:

- Feed the machine pneumatically acting on the blocking valve mounted on the general air regulation group1.
- Ensure that the feeding pressure is correct.
- Power supply the machine electrically acting on the isolator placed on the electrical control board.
- Wait until the machine program shows the main display.
- Turn on the electrical circuits pressing the ignition key.
- Unhook the machine emergency by means of the appropriate red mushroom button.
- Restore the extra-run key.
- Restore possible intervened operator safety.
- Reset the machine axles.

Switching the machine off

G-002

To correctly turn the cutting machine off, it is necessary to carry out the following operations:

- Make sure that on the cutting table there are no plates or pieces of glass.
- Press the emergency button located on the control panel.
- Turn off the electrical circuits pressing the turn-off key.
- Remove the electrical power supply acting on the isolator placed on the electrical control board.
- Remove the machine pneumatic supply acting on the blocking valve mounted on the general air regulation group.

EMERGENCY STOP

G-003

All cutting tables supplied by Bottero S.p.A. are provided with one or more emergency buttons which allow to immediately block all of the line operations.
To enable the emergency stop it is sufficient to press the red mushroom button.
To restore the emergency stop, it is necessary to turn the mushroom key clockwise, restore the circuit with the reset key and press the blue key which enables the operator safety devices.

1 Located at the side of the electrical control board.

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LOADING THE PLATE

F-004

The evo model structure has six possible cutting tables: the fixed or balancing 352BCS^{evo} and the 352LMT^{evo} or the 340BCS^{evo} or the 340LMT^{evo}.
The BCS abbreviation means a machine that makes shapes, while the LMT has the difference of being able to remove the low emissive from the glass.

NOTE:

Low emissive:
This name is given to the glass plates which present a treated face (generally metal and/or metal oxide deposits) for obtaining a reflection toward the inside of the environment of irradiated heat of the heating elements. Many types of low emissive glass are on the market which differ among themselves for the production technological process and for the physical-technical and energetic features.

Balancing or fixed cutting tables 352BCS^{evo} and 352LMT^{evo}

F-005

Loading plate on balancing table:

- Lift the cutting table pressing the table ascent key on the control panel.
- Load the plate using the adequate lifting items and accessories.
- Lower the cutting table using the control panel key.
- Turn the fans on and place the plate in parallel with the zero plate references.[2]

Loading plate on fixed table:

- Turn the fans on and manually move the plate from the loading table to the Bottero cutting table, or else call the plate using the key on the control panel.[3]

Fixed cutting tables 340BCS^{evo} and 340LMT^{evo}

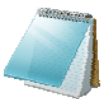
F-006

Loading plate on fixed table:

- Call the plate using the key on the control panel.[4]

NOTE:

Loading operations can be facilitated by an optional plate-pushing device which allows to remove the glass from the work surface and to avoid the plate from being scraped by the gripper.
The button that drives this device is the same that drives panel ascent. Once the panel is lifted, press the panel ascent button again to extract the plate-pushing cylinders.
This device can be driven only if the work panel is in the loading position, that is, completely tilted. The device goes back automatically when the work panel returns to the horizontal position.



2 A series of holes in the air cushion have a different colour and indicate the glass positioning zone.

3-4 Only if the table is coupled with a loading device.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

CUTTING DATA INSERTION

G-007

Cutting data insertion is similar for all Evo model cutting tables.

- Measure the plate on the table.
- Press the F6[5] function key and insert the values that have been found. Manually type in a cutting cycle using the keyboard, otherwise load an optimisation using Smartkey or use the company network to acquire cutting schemes elaborated in office.

CUTTING CYCLE

G-008

- Having inserted the cutting data, **check that the F12 key is green** and then press the cycle key on the control panel.

NOTE:

The mechanical safety barriers will rise and the cutting bridge will search for the plate and then will carry out the cutting cycle described on the video scheme.

GRINDING CYCLE

G-009

- After having inserted the cutting data, check that the F12 key is green.
- Press the F11 function key[6] and then enable the grinding wheel clicking the relative box.
- Press the cycle key on the control desk.

NOTE:

The mechanical safety barriers will rise and the cutting bridge will search for the plate and will then carry out the first grinding cycle followed by the glass incision.

5 Consult the **"Software Use"** manual**.**

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

PLATE CUT RUNNING OF THE CUT GLASS

G-010

352BCS^{evo} or 352LMT^{evo} balancing cutting tables:

- When the cutting cycle has been completed, with the machine in zero position, enter the cut running area.
- Plate movement, by means of the air cushion[7].
- Positioning of the incision at the centre of the cut running bar.
- Cut running bar ascent using the pedal on the ground near the bar itself.
- As soon as the glass is cut run, release the pedal.
- Move the beam that has just been cut run.
- Rotate the beam and open the cuts inside of it.
- Open the other incisions on the remaining plate.
- Finished piece unloading.

340BCS^{evo} or 340LMT^{evo} fixed cutting tables:

- When the cutting cycle has been completed enter the cut running area.
- Call the cut plate using the plate calling button placed on the push button board at the edge of the cut running table.
- Turn the fans on using the button on the same push button board.
- Plate movement, by means of the air cushion [8].
- Positioning of the incision at the centre of the cut running bar
- Cut running bar ascent using the pedal on the ground near the bar itself.
- As soon as the glass is cut run, release the pedal.
- Move the beam that has just been cut run.
- Rotate the beam and open the cuts inside of it.
- Open the other incisions on the remaining plate.
- Finished piece unloading.

7 Pedal on the ground.

8 Pedal on the ground.

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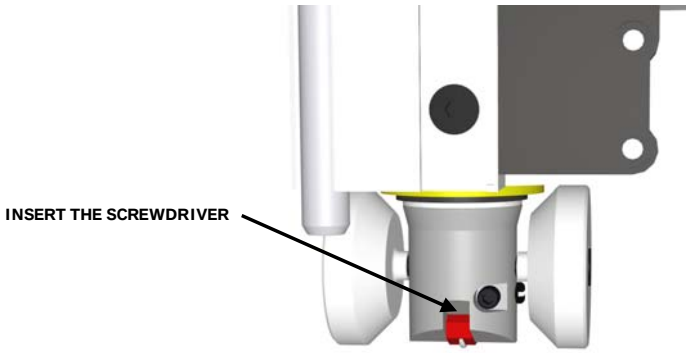
REPLACEMENTS

Replacement of the small cutting wheel on the standard head

G-011

The Evo model cutting tables carry out the glass incision by means of a small wheel inserted in a plastic or iron wheel holder, depending on the type of head installed on the purchased machine.
If the iron wheel is used, the wheel holder needs to be regulated by a special retaining dowel which avoids the tool holder from falling during the phases of the cycle.
The plastic wheel is pushed lightly until it fits in the end.



PREPARATION OF THE MACHINE

When operating on the machine to replace the small cutting wheel, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- **To remove the electric and pneumatic energy to the machine.**[9]

REMAINING RISKS

To carry out this maintenance it is compulsory to use mechanical utensils: risk of being cut.

Individual protection devices to be used:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Reach the cutting head and replace the cutting wheel inserting a screwdriver in the lower part of the head, then pressing down.
- When it has been expulsed, insert a new wheel pressing up.
- Having completed the operation, leave the working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

NOTE:

The life of the small wheel can vary mainly depending on the quality of the glass, on the type and quality of the lubricant, on the cutting pressure and on the mechanical regulation more or less appropriate of the trolley. The various colours of the wheels indicate the different angle degree of the same.

[9] Consult section **"E- Exclusion-restoration of energy"** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of cutting wheel on head with low emissive removal grinding wheel optional

For the machines with low emissive removal grinding wheels (EASY DELETION), replacement of the small wheel is carried out by means of the software facilitation which **rotates the cutting head at a degree** capable of inserting the screwdriver for its expulsion.

PREPARATION OF THE MACHINE

When operating on the machine to replace the small cutting wheel, it is compulsory:

- To remove any pieces of glass present on the cutting table using anti-cut gloves.
- On the main display of the program to press the **F10 function key**.

PG-001

- On the GENERAL menu to select the **Tool change** command.
- To press the cycle key on the control desk to rotate the cutting wheel.
- **To remove electrical and pneumatic energy to the machine.**[10]

REMAINING RISKS

To carry out this maintenance it is compulsory to use mechanical utensils: risk of being cut.

Individual protection devices to be used:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Reach the cutting head and replace the cutting wheel inserting a screwdriver in the lower part of the head, then press down. When it has been expulsed, insert a new wheel pressing up.
- Having completed the operation, leave the working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E- Exclusion-restoration of energy** and restore the operator protection circuits.

NOTES:

NOTE 1: Having replaced the small wheel, it is advisable to check lubricant leaks.[11]

NOTE 2: If the angle for inserting the screwdriver is not correct, vary the degrees in the appropriate box in the tool change menu.

[10] Consult section **"E- Exclusion-restoration of energy"** in this manual.

[11] Consult following pages.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of the grinding wheel on 352LMT^{evo} and 340LMT^{evo} cutting tables

G-013

The machines provided with a grinding wheel for low emissive removal eventually need the grinding wheel to be replaced due to wear or use of another grinding wheel with different features. In case of wear, the software gives a warning with information on the video to replace the grinding wheel.

The grinding wheel replacement is facilitated using the machine software which rotates the grinding unit to make it accessible to disassemble the carter and grinding wheel.

PREPARATION OF THE MACHINE

When operating on the machine to replace the grinding wheel, it is compulsory:

- To remove any pieces of glass present on the cutting table using anti-cut gloves.
- To press the **F10 function key** of the program main display.

PG-002

- On the GRINDING WHEEL menu, to click **Grinding wheel change**.
- To press the cycle key on the control desk.
- **To remove electrical and pneumatic energy to the machine.**[12]

REMAINING RISKS

To carry out this maintenance it is compulsory to use mechanical utensils: risk of being cut. Possible grinding dust.

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- As soon as the machine is placed near point zero, rotating the grinding unit towards the outside of the table, access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Remove the grinding wheel protection cover❶ loosening the screws which block it.
- Loosen the screw❷ which blocks the dust suction fan.
- Take the fan❸ out.
- Loosen the screws❹ which block the flange against the grinding wheel.
- Pull the flange and remove the worn grinding wheel, clean the base and insert the new one.
- Remount the flange which blocks the grinding wheel tightening the screws well.
- Remount the fan paying attention to the blade.
- Fix the protection carter using the screws previously removed.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E- Exclusion-restoration of energy** and restore the operator protection circuits.
- Return to the control pulpit and press the zero axle reset.
- Rectify the grinding wheel by means of the machine software.[13]

[12] Consult section **"E- Exclusion-restoration of energy"** in this manual.

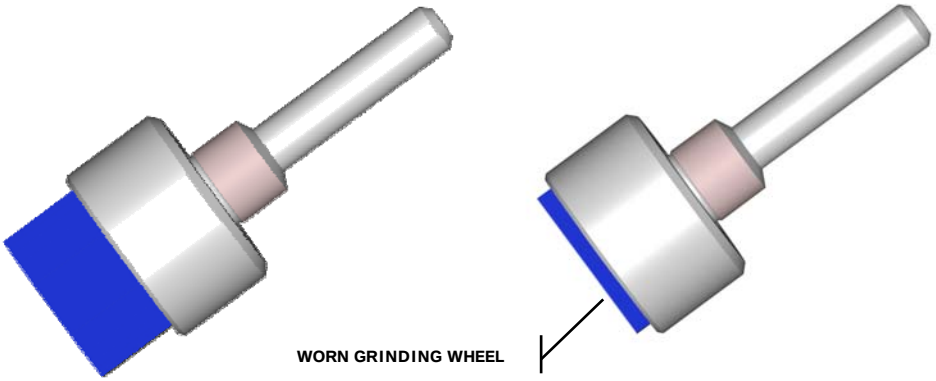
[13] Instructions described in "Software use" manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Grinding wheel replacement on cutting tables with Easy Deletion optional

G-014

The machines provided with a grinding wheel for low emissive removal eventually need the grinding wheel to be replaced due to wear or use of another grinding wheel with different features.



The machine with the EASY DELETION optional does not check the thickness of the grinding wheel mounted on the grinding chuck, it is therefore compulsory to visibly check the thickness of the grinding wheel at each cycle. If a minimum level of 2 millimetres of material is found, it is compulsory to replace the grinding wheel.

PREPARATION OF THE MACHINE

When operating on the machine to replace the grinding wheel, it is compulsory:

- To remove any pieces of glass present on the cutting table using anti-cut gloves.
- **To remove electrical and pneumatic energy to the machine.**[14]

REMAINING RISKS

To carry out this maintenance it is compulsory to use mechanical utensils: risk of being cut.

Individual protection devices to be used:

- Light leather five finger gloves.

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Reach the cutting and grinding trolley and **lift the grinding wheel protection carter** unscrewing the side fastening knobs and then close them when the carter is lifted.
- **Remove the worn grinding wheel unscrewing the blocking nut** using the two keys provided with the machine.
- **Insert the new grinding wheel all the way** and close the blocking nut **carefully.**
- Lower the protection carter making sure to hook the safety end run and close the side knobs once again.
- Having completed the operation, leave the working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Clean the grinding wheel using the machine program.[15]

[14] Consult section **"E- Exclusion-restoration of energy"** in this manual.

[15] **Key F10** and then click the icon **CLEANING**.

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CUTTING LUBRICATION

G-015

The lubrication of the incision is very important to maintain a cut in optimum conditions before carrying out plate cut running.
It is also important that there is not an excessive amount of lubricant on the incision, to avoid problems of successively washing the pieces.

Cutting lubrication regulation

G-016

The amount of oil deposited on the glass plate is adjustable by means of a tap placed on the cutting trolley near the head itself.

PREPARATION OF THE MACHINE

When operating on the machine for regulation of the amount of oil deposited on the glass, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- **To remove electrical and pneumatic energy to the machine.**[16]

REMAINING RISKS

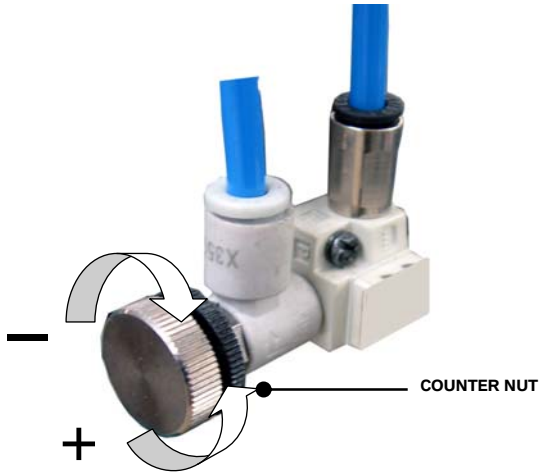
This maintenance does not foresee remaining risks.

Individual protection devices to be used:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Identify the tap mounted on the cutting trolley.
- Unscrew the counter nut and adjust the oil amount acting on the knob mounted on the tap.
- Close the counter nut again.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a cutting cycle and check the amount of oil deposited on the incision. See if the regulation pleases you, or else repeat the above operations.



16 Consult section **"E- Exclusion-restoration of energy"** in this manual.

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Cutting lubrication leak check

G-017

This function is present on Bottero cutting tables and allows the operator to purge the lubrication plant from possible air bubbles.
Air bubble formation can be caused by changing the cutting wheel, after having cut plastic or if the operator forgets to fill the cutting oil tank, letting it empty completely.

PREPARATION OF THE MACHINE

When operating on the machine to check cutting oil leaks, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- To place a container underneath the cutting head.

REMAINING RISKS

To do this maintenance it is necessary to handle oil: risk for eyes and hands.

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

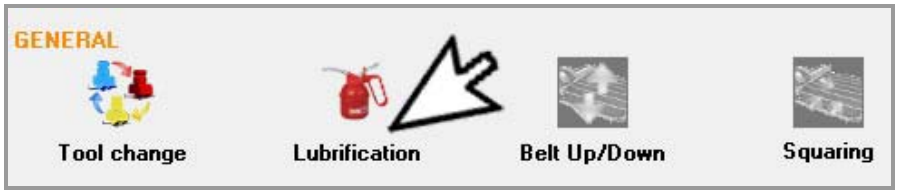
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Place a container beneath the cutting head to collect the oil and to avoid oil from ruining the cutting table cloth.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section E**-Exclusion-restoration of energy.**
- On the main program display press the **F10 function key.**
- On the GENERAL menu click **Lubrication**.

- **Keep the CUTTING CYCLE buttonpressed for a few seconds** until only oil comes out of the cutting head.
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Remove the container from beneath the head and, **if clean, recuperate the cutting oil.**
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



PG-003

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Cutting lubrication purge

G-018

This function is present only on cutting tables on which the optional for plastic film cutting for glass sanding is installed. The purge operation must necessarily be carried out before cutting a film to avoid lubricating oil residue from dripping on the plastic, which could ruin its consistence or unglue it from the glass surface.

PREPARATION OF THE MACHINE

When operating on the machine for lubrication purging, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- To place a container underneath the cutting head.

REMAINING RISKS

To do this maintenance it is necessary to handle oil: risk for eyes and hands.
During this maintenance it is necessary to wear the following individual protection devices:

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Place a container beneath the cutting head to collect the oil and to avoid oil from ruining the cutting table cloth.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section E**-Exclusion-restoration of energy.**

PG-004

- On the main program display press the **F10 function key.**
- On the **PLASTIC** menu select the **Purge** function.
- Keep the CYCLE button pressed until air comes out of the cutting head.
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Remove the container from beneath the cutting head.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Cutting lubrication oil tank top-up

G-019

The oils to be placed on the incision are contained inside of two tanks and are kept on one side of the electrical control board. **Before oil top-up or its replacement, it is compulsory to remove pressure from the inside acting on the appropriate tap placed at the side of the tank itself.**

PREPARATION OF THE MACHINE

When operating on the machine for incision lubrication oil top-up, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- To tilt the table. (only for balancing tables)
- **To remove electrical and pneumatic energy to the machine.**[17]

REMAINING RISKS

To do this maintenance it is necessary to handle oil: risk for eyes and hands.

Individual protection devices to be used:

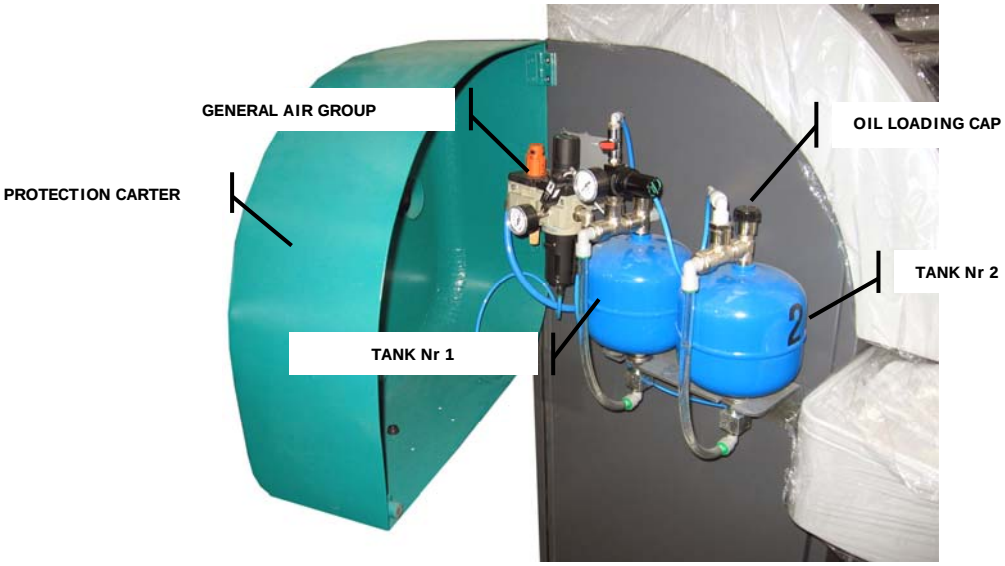
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Open the protection carter placed on the side of the electrical control board.
- Remove pressure from inside bringing the tap to horizontal position.
- Locate the type of tank to be topped-up.[18]
- Unscrew the loading tap placed above the tank.
- Fill the tank checking the amount of oil by means of the oil level.
- Close the cap previously removed.
- Restore pressure to the tank setting the tap again at the original position.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



17 Consult section **"E- Exclusion-restoration of energy"** in this manual.

18 **Number 1** on the tank indicates NORMAL oil content. **Number 2** indicates presence of high vaporating oil, used on low emissive glass.

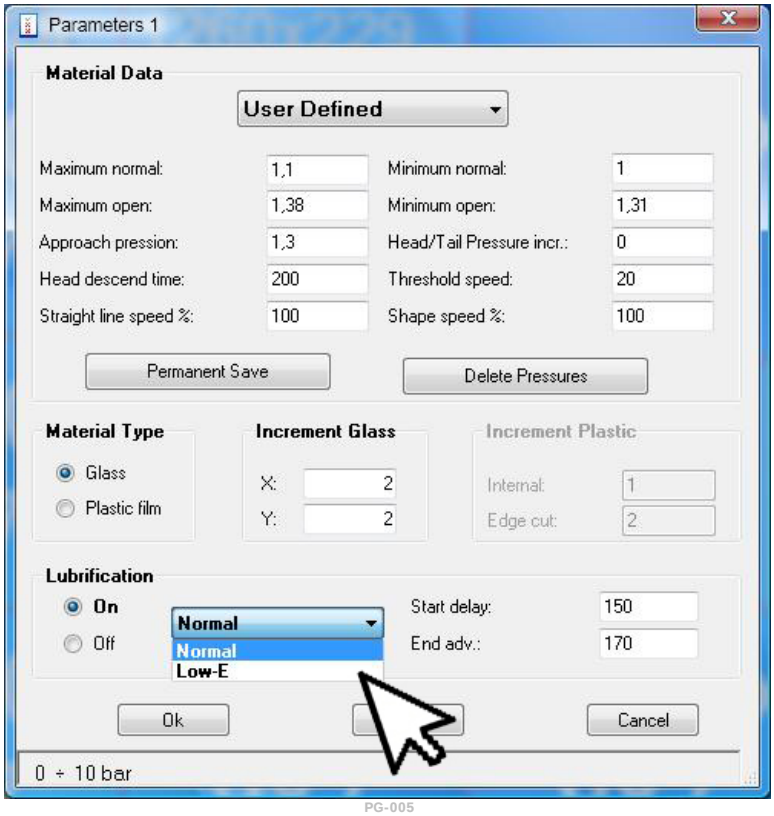
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Double lubrication selection

G-020

The cutting machines provided with the optional for low emissive removal are supplied with a double oil tank. The double tank makes it possible to choose the type of oil to deposit on the incision.
The low emissive glass requires a particular treatment both for handling and for the oil to deposit on the glass itself.

The request of the type of oil to release on the glass is made directly by the software using the menu which is displayed pressing the **key combination ALT+1**.
Bringing the cursor to the bottom part of the screen and clicking the down arrow the new hanging menu gives us **the choice of two types of oil: normal oil and Low-e oil.**
Moving the cursor down and clicking the type of oil one goes to the selected oil.
Confirm the choice with OK.



PG-005

NOTE:

Remember that the choice of oil for low emissive glass (Low-e) requires the tap to be closed.

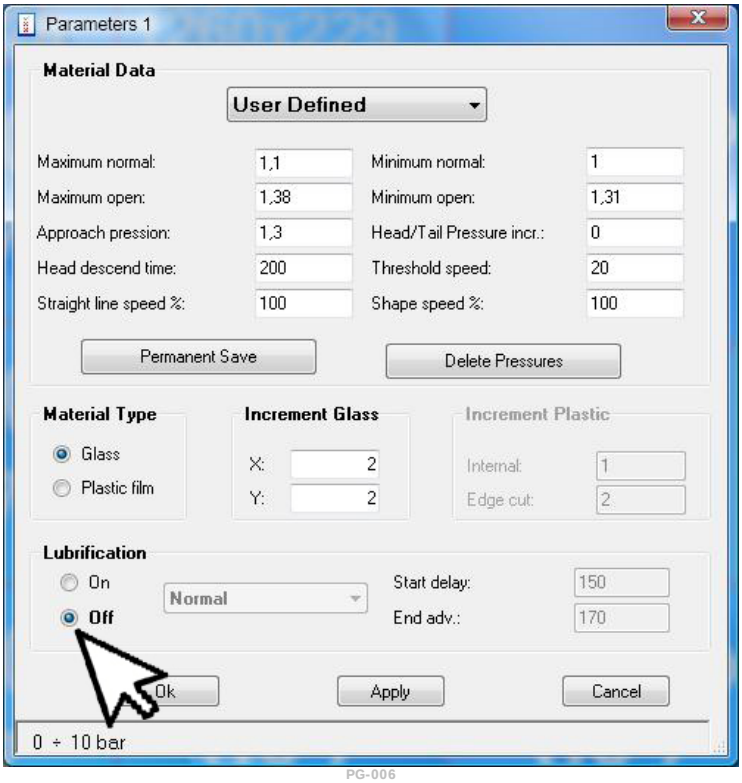
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Exclusion of lubrication from the incision

G-021

If it is useful to totally exclude the lubrication from the cut, because of particular glass works, the software manages this possibility as well.

Using the key combination ALT+1, and bringing the cursor to the bottom part of the screen, we exclude the lubrication **clicking Off with the mouse and confirming Ok**.



PG-006

To restore lubrication, just click **On** and then **confirm with Ok**.

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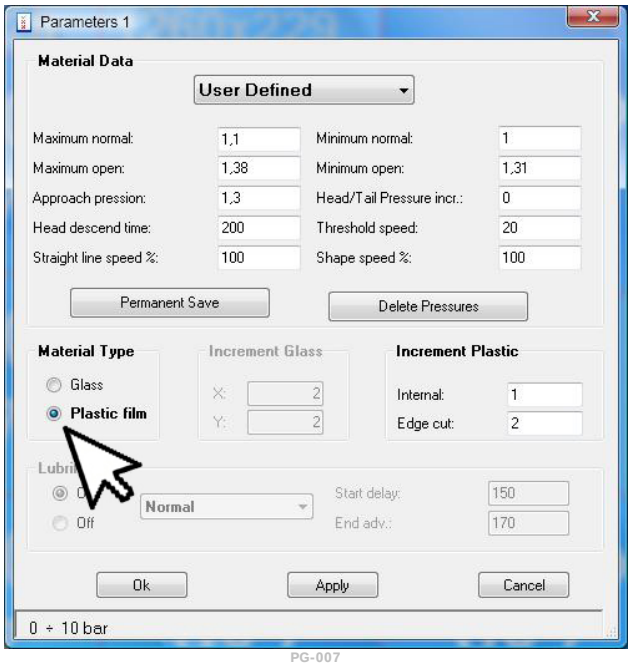
CUTTING OF VINYL

G-022

Cutting machines provided with the OPTIONAL for cutting plastic film (Vinyl) carry out this film incision thanks to a utensil inserted in place of the wheel holder.
This utensil approaches the glass and the incision on the film using different parameters from those used for glass incisions thanks to the BCMSWin Bottero software control.

Using a primitive already defined, the film is applied on the glass in linear mode, without leaving air bubbles which could then compromise the quality of the shape produced by the removal of the vinyl.
Then the glass is placed in proximity of the zero plate reference lines, the **dimensions of the primitive are inserted pressing the function key F6** on the program main display.
Then the cutting data and the chosen shape are inserted, and **undesired cuts are disabled**.



PG-007

PREPARATION OF THE MACHINE

When operating on the machine to assemble the vinyl cutting utensil, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the cutting table.
- **To remove electrical and pneumatic energy to the machine.**[19]
- To bring to the cutting table the plastic cutting kit supplied by Bottero. (including the nose pliers to insert the utensil)
- **To press the key combination ALT+1.**
- To bring the cursor onto **Material Type** and to select **Plastic.** (lubrication goes to Off automatically)
- Confirm the choice with OK.
- Purge[20] the head from the oil remaining in the machine plant.

REMAINING RISKS

For this maintenance it is necessary to handle a utensil with the risk of getting cut.

Individual protection devices to be used:

- Anti-cut gloves.

As well as:

- Adequate clothing.
- Accident prevention shoes.

[19] Consult section **"E- Exclusion-restoration of energy"** in this manual.
[20] Consult subject "**G- Lubrication purge**"

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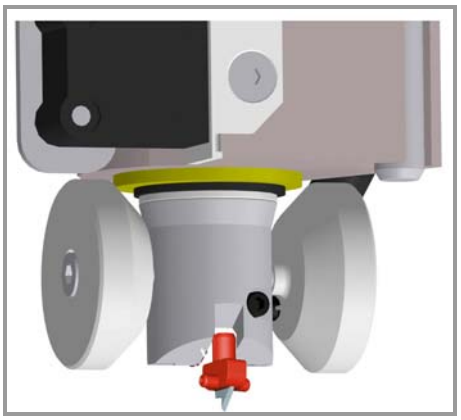
DESCRIPTION OF THE OPERATION

Expulsion of cutting wheel

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to machine working areas** in this manual.
- Having reached the cutting head, proceed to the expulsion of the cutting wheel inserting a screwdriver in the lower part of the head, then pressing down.

Insertion of plastic incision utensil

- Using nose pliers, **we hook our utensil on the part of the cutting material** and moving up we fit it into the lower part of the cutting head reaching the end of the tool holder.
- Having completed the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section E-**Exclusion-restoration of energy**.
- **Pressing the CYCLE key**, placed on the control desk, the machine will carry out a vinyl cutting cycle displayed on the monitor.



The correct direction for utensil insertion varies according to the machine quadrant. The blade that cuts the vinyl is always mounted in the direction of the positive movement of the cutting bridge.

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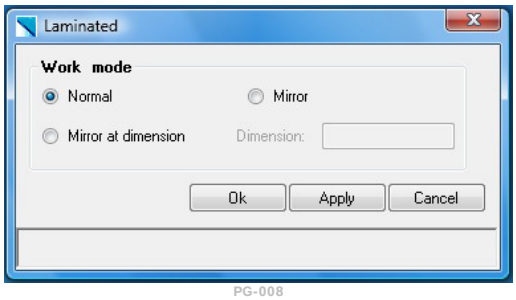
CUTTING OF LAYERED GLASS

G-023

On the main display, pressing the function key F5, whose icon is represented here at the side, the program displays a cloud menu from which it is possible to set the machine cutting cycle as Normal, Specular or Specular Quota.



PG-008

Thanks to this function, the program allows to cut the scheme displayed on the screen in specular mode overturning it on the Y axis.
The function is normally used when a layered glass plate must be cut.

To cut a layered glass plate one must:

- Carry out a first cycle in normal mode.
- Turn the plate over on the Y axis and **once again carry out the cutting cycle after having enabled the specular cycle mode**.

There are two types of specular modes:

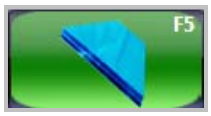
Specular:

The electronic alignment of the machine is carried out at a distance of mechanical zero equal to the width of the set plate.

Specular quota:

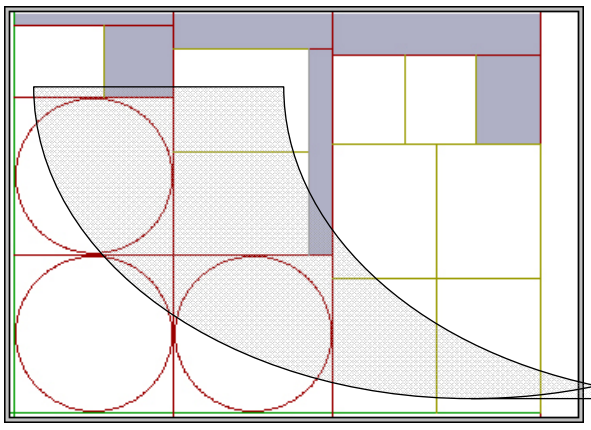
The electronic alignment of the machine is carried out at a distance of mechanical zero equal to the value inserted in the **quota** field.

It must be noted that the function remains active at the end of the specular cycle: the operator must therefore remember to disable it to return to the monolithic cycle, **pressing F5 again and choosing Normal**.
The cycle mode is also represented graphically by the F5 icon on the main display:

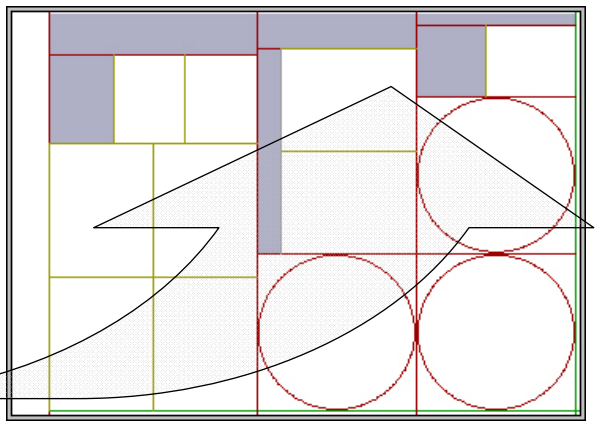


Specular cycle: Green Icon background

Normal cycle: Black icon background



Example of cutting cycle displayed and cut in **Normal** mode.



Cutting cycle done in **Specular** mode.

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MANUAL CONTROLS

G-024

On the BCMSWin program main display, **pressing the function key F10**, a screen is displayed with new icons which act as “controls” to carry out all the manual movements allowed by the machine.
This screen is different depending on the type of machine purchased and on the installed optionals.
We will describe this screen with most of its functions.

PG-009

Description of the screen

G-025

The screen is divided in five separate sections:

- **GENERAL**
- **PLATE**
- **GRINDING WHEEL**
- **SHAPE SCANNER**
- **PLASTIC**

All of the manual controls are driven by a Cycle button and can be stopped by the STOP button.
When necessary, the emergency button immediately stops the movement in progress.

Cycle

STOP

Emergency

NOTE:

More detailed explanations of these subjects found in “Software use” manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

GENERAL:

G-026

PG-010

Tool change: (Small wheel change)

- Rotates the head to the desired degree to facilitate the extraction of the wheel holder.
- Press to carry it out.

Lubrication:

- Keeping the cycle key pressed it pushes the oil out of the cutting head.
- Press to carry it out.

Conveyer belts:

- Pressing the ascent icon, it raises the conveyer belt frame.
- Pressing the descent icon, it lowers the conveyer belt frame.
- Press to carry it out.

Alignment:

- Pressing the forward icon, it aligns the plate.
- Pressing the reverse icon, it resets the plugs in zero position.
- Press to carry it out.

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PLATE:

G-027

PG-011

X 90° degrees:

- Clicking on the icon, a new display opens which instructs the operator for carrying out the 90° regulation of the X axis of the head.
- Press to carry it out.

Y 90° degrees:

- Clicking on the icon, a new display opens which instructs the operator for carrying out the 90° regulation of the Y axis of the head.
- Press to carry it out.

Diagonal calibration:

- Clicking on the icon, a new display opens which instructs the operator for carrying out the regulation of the diagonals on the cutting bridge.
- Press to carry it out.

Dimension check:

- Checks the exact dimension of the plate previously inserted in the cutting scheme.
- Press to carry it out.

Dimension measurement:

- The machine measures the glass dimensions present on the cutting table, as long as cutting schemes have not been typed in the markers' area.
- Press to carry it out.

Thickness reading:

- Allows the operator to detect the thickness of the glass present on the cutting table.
- Press to carry it out.

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GRINDING WHEEL:

G-028

PG-012

Cleaning:

- Allows cleaning the grinding wheel base. For the machine with the Easy Deletion optional, the cleaning will be carried out on the edge of the glass, while for the LMT machine the cleaning is done by the rectification group.
- Press to carry it out.

Grinding:

- For the LMT machine, the rectification of the grinding wheel base is carried out on the rectification group passing twice.
- Press to carry it out.

Grinding wheel change:

- The grinding unit carries out a rotation equal to the degrees inserted in the box at the side of the screen. This rotation facilitates the opening of the grinding wheel carter and other disassembly operations.
- Press to carry it out.

Calibration measurement:

- The machine measures the diameter of the grinding wheel bringing itself to the rectification group. This operation is done automatically at the beginning and the end of every manual cleaning or grinding wheel rectification operation.
- Press to carry it out.

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SCANNER:

G-029

PG-013

Single:

- Allows carrying out the scanning of a single shape with automatic search of the starting scanning point.
- Press to carry it out.

Multiple:

- Allows carrying out in one sole cycle the scanning of several shapes placed on the cutting table surface.
- Press to carry it out.

Compound:

- Allows the detection of shapes composed of several distinct profiles, like for example shapes including holes inside of them.
- Press to carry it out.

PLASTIC:

G-030

PG-014

Purge:

- Purges oil from the lubrication plant. Operation to be carried out every time a plastic cutting cycle is carried out.
- Press to carry it out.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

I ROUTINE MAINTENANCE

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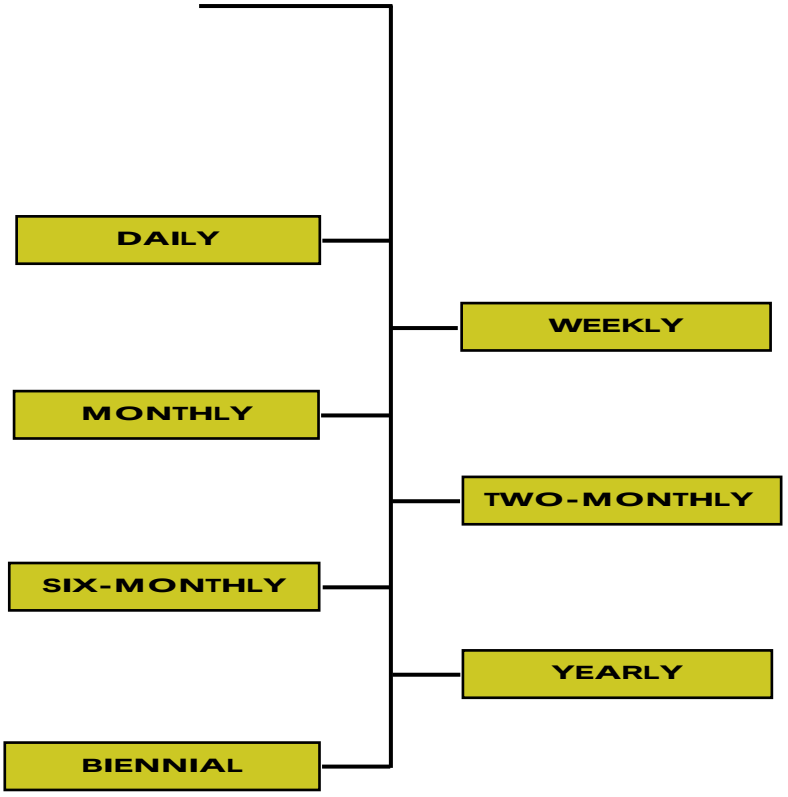
Foreword

I-001

This section of the manual describes all the operations of **ROUTINE maintenance** to be carried out on the monolithic glass cutting tables **EVOLUTION model** manufactured by Bottero S.p.A.
These operations are only to be carried out during the time intervals described in the sections and **can also be carried out by the operator, if adequately trained.**
If carried out or not, these operations can compromise the entire functioning of the machinery.
In case these operations are not carried out, **Bottero S.p.A. declines every type of responsibility** on the correct functioning of the machine, as well as the warranty on the damaged parts.
Remember that the operator or maintenance, before carrying out these operations, must also be completely **aware of the accident prevention rules and of the safety devices to use**; the relative section is intended for this purpose.
Also remember that **these operations must be** carried out without pieces of glass present on the machine and that the operator must **always position the machine on zero** before carrying out the procedures described in the following chapters.

/ Thread friction coefficient The maintenance times vary depending on which part of the machine needs maintenance. The maintenance is subdivided in:



The various maintenance operations are described in a simple and intuitive manner and can also be carried out by **the operator, if he keeps to the instructions described in the following manual.**

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COMPONENT CLEANING

Cleaning of the felt and carpet

I-002

Estimated maintenance time 10 minutes.

The cleaning of the felt must be carried out daily, preferably at the end of the work shift.
The felt, or cleaned carpet, assures the absence of lines on the finished product, caused by possible glass splinters found on the table.

PREPARATION OF THE MACHINE

Before operating on the machine to clean the work surface it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[1]

REMAINING RISKS

Falling off the table during cleaning operation of the Jumbo model table.
Inhaling dusts.

Individual protection devices to be used:

- Protection mask.
- Protection glasses.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area keeping to the procedures reported in the section of this instruction manual **D-Access to the operative items.**
- To clean the felt, it is preferable to use specific equipment, as for example an industrial carpet sweeper. If it is not available use a simple broom or vacuum cleaner. **It is absolutely forbidden to use compressed air, because, besides raising all the Lucite, it can transform the glass splinters into "projectiles", dangerous for whoever passes by the cutting table and to the person doing the cleaning.**
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

[1] Consult section **E- Exclusion-restoration of energy** in this manual.

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Fan filter cleaning

I-003

Estimated maintenance time 15 minutes.

The electrical control boards of the cutting machines are provided with a ventilating system which allows dissipating the heat produced by the components present inside the electrical control board.
The air, pushed inside of the board by means of appropriate fans, is filtered to avoid the dust from accumulating and thereby compromise the operating of the components. **Two-monthly cleaning**.

PREPARATION OF THE MACHINE

Before operating on the machine to clean the filters it is compulsory:

- **To remove the electric and pneumatic energy to the machine.**[2]

REMAINING RISKS

Dust movements.

Individual protection devices to be used:

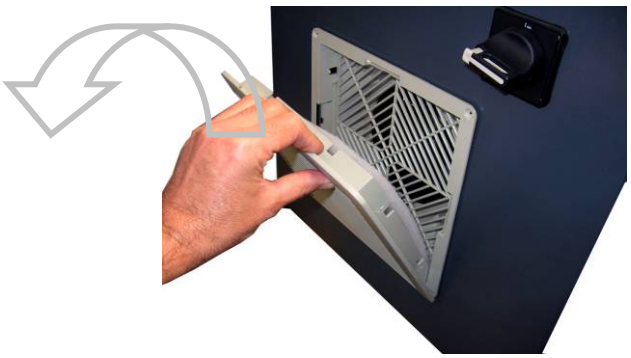
- Protection mask.
- Protective glasses.

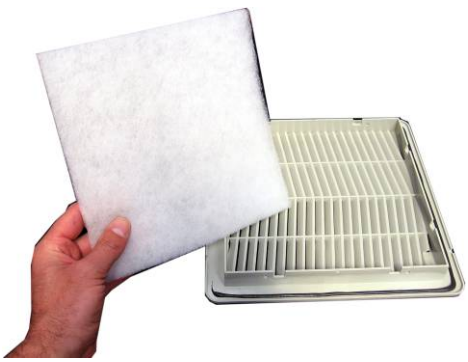
As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Having identified the position of the filters[3], dismantle the cover putting pressure on it with a screwdriver toward the outside and clean the filtering tissue with water and neutral soap.
- Carefully dry the washed tissue and reassemble it all.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.





[2] Consult section "**E- Exclusion-restoration of energy"** in this manual.
[3] Consult electrical layout.

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Cleaning of the glass alignment photocell

I-004

Estimated maintenance time 5 minutes.

Thanks to this device, the machine is able to detect both the dimensions[4] and the exact position of the plate on the table. Its correct maintenance therefore assures the precision of the cuts carried out on the edge of the plate.
A daily cleaning interval is recommended.

PREPARATION OF THE MACHINE

When operating on the machine to clean the photocell, it is compulsory:

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[5]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.

REMAINING RISKS

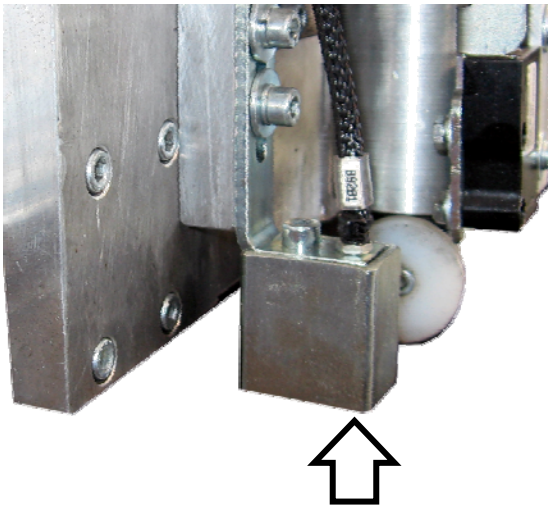
This operation does not present any remaining risks.

Individual protection devices to be used:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Once the photocell is identified, which is still anchored to the cutting trolley, pass under the protection carter with a dry antistatic cloth using a slight pressure on the lens.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



NOTE:

The alignment photocell is always covered by a small carter which protects it from being bumped.
Without dismantling the carter, it is possible to clean the focusing lens which is found below the protection.

It is forbidden to use any type of liquids (alcohol, solvents, detergent etc.) in that they might ruin the sensor.

[4] To be configured in the software program.

[5] Consult section "**E- Exclusion-restoration of energy**" in this manual.

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Cleaning of the guides, wheels and bridge and trolley sliding racks

I-005

Estimated maintenance time 5 minutes.

Cleaning and greasing [6] these components are two of the most important maintenance operations for the correct operating of the cutting table as it guarantees a good movement of the axles of the machine and prevents jibs and breaking of moving items.
To not carry this maintenance out may cause breaking of the ball bearings and pinions and may compromise the cutting table tolerance. **The interval for cleaning, coupled with greasing, is weekly**.

PREPARATION OF THE MACHINE

When one operates on the machine to clean the bridge and trolley sliding components it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[7]

REMAINING RISKS

Bumping the table carpentry.
Inhaling products used for maintenance.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Protection mask.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Carefully clean both the bridge and the trolley rack, using a small bush or a hard bristle brush.
- Clean with a cloth moistened with oil all the guides on the machine.
- Spray the **FIN SUPER (Interflon)** lubricant both on the guides and on the racks.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a pair of simulated cycles so that both the bridge and the trolley move along the whole length of the guides and gather the lubricant.

[6] Consult subject**"Particulars greasing".**

[7] Consult section **E- Exclusion-restoration of energy** in this manual.

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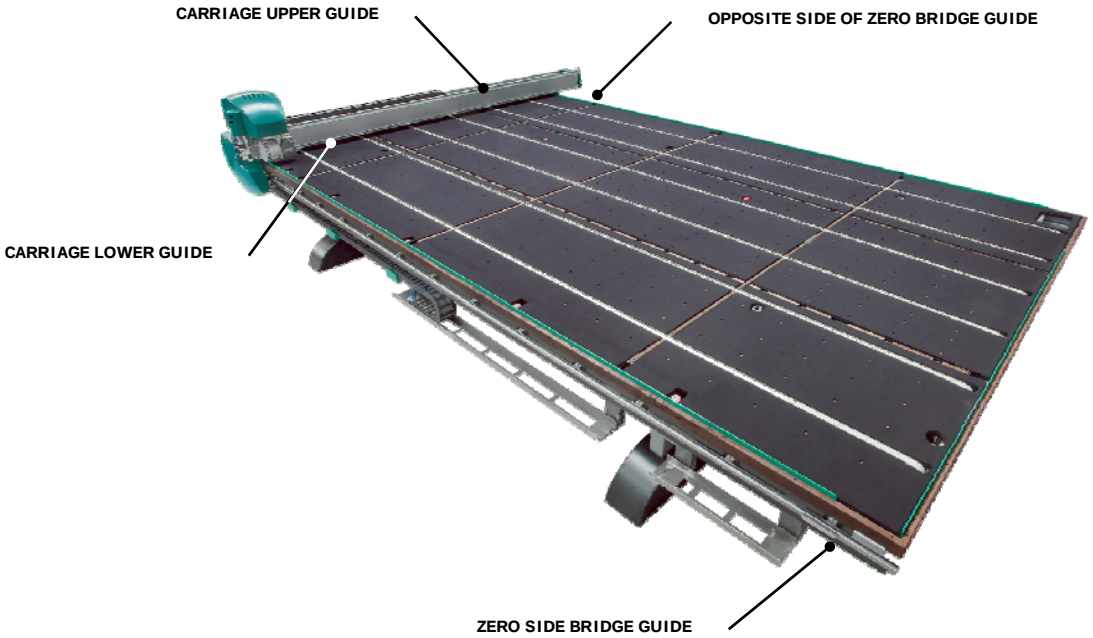
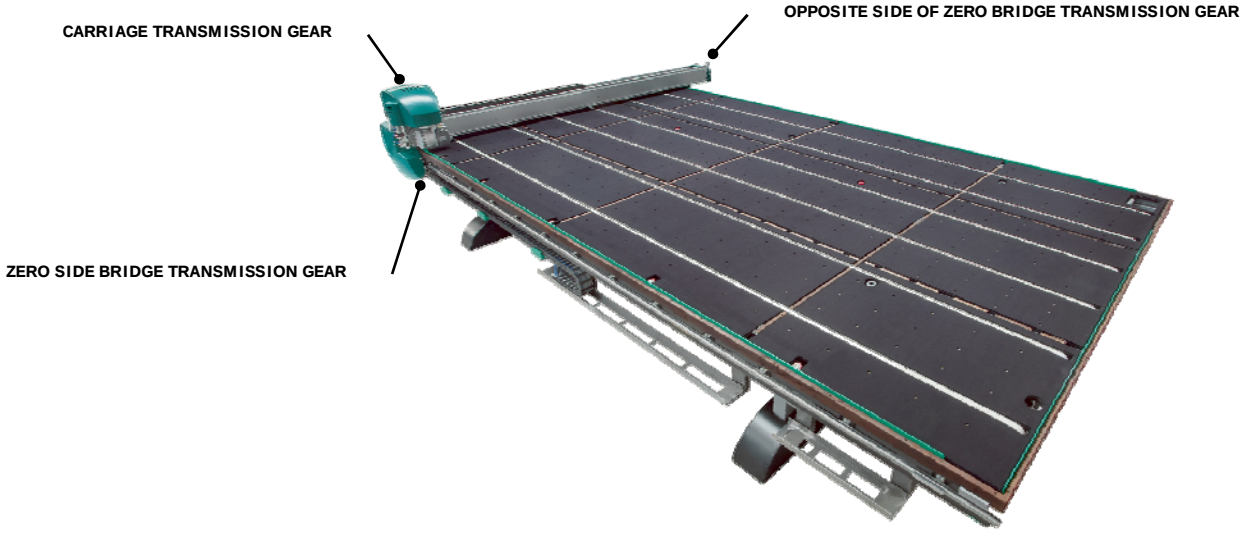
GUIDES TO BE CLEANED ON SERIES 352^{evo} TABLES



GEARS TO BE CLEANED ON SERIES 352^{evo} TABLES



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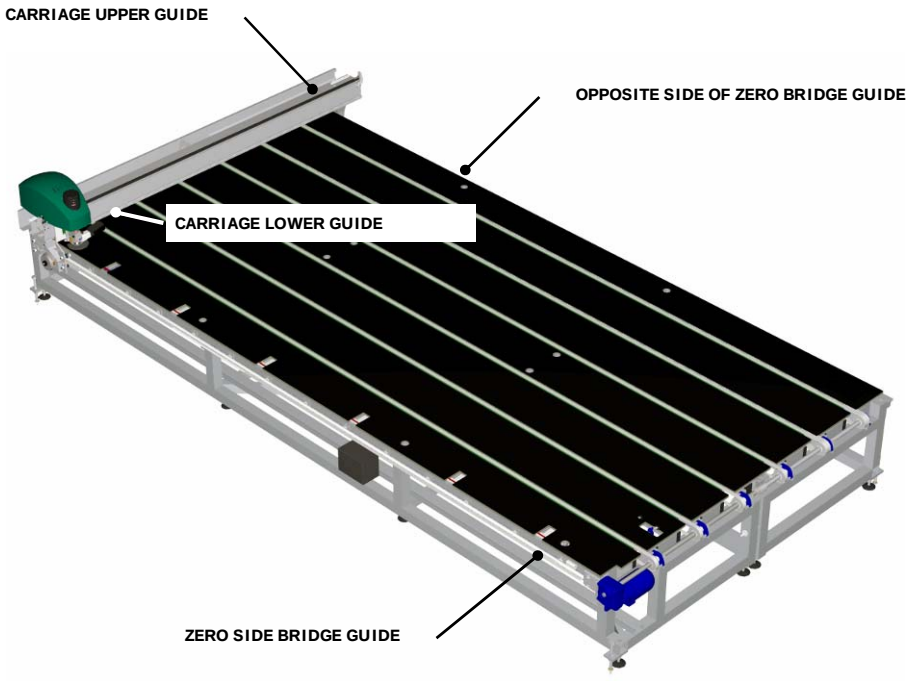
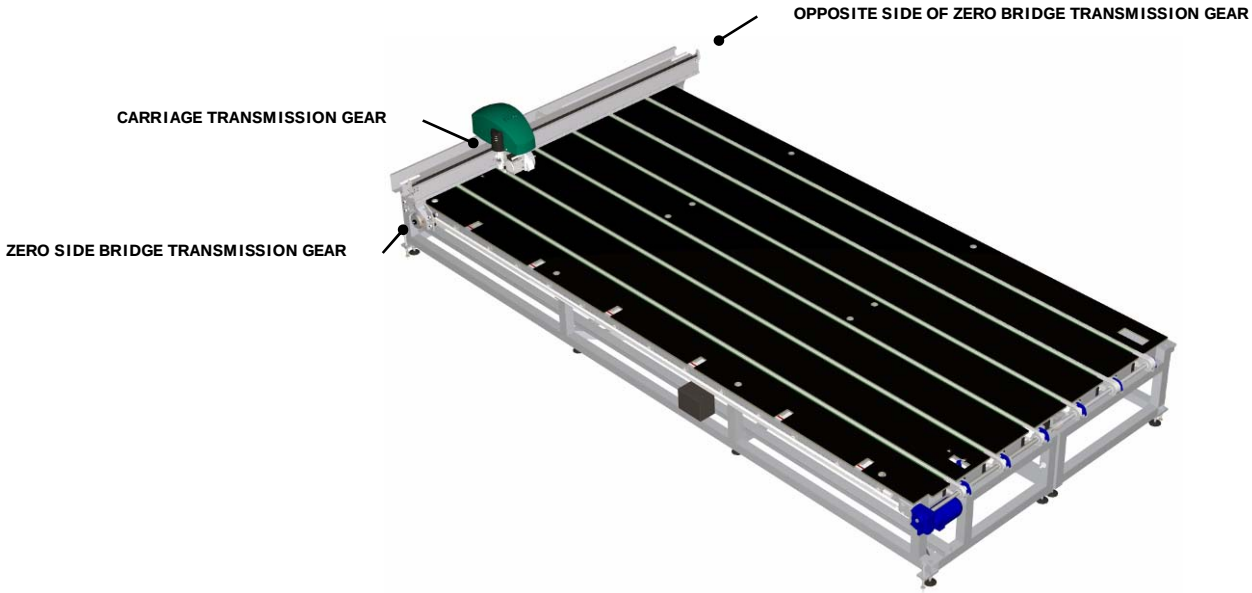
GUIDES TO BE CLEANED ON SERIES 340^{evo} TABLES



GEARS TO BE CLEANED ON SERIES 340^{evo} TABLES



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Air cushion hole cleaning

I-006

Estimated maintenance time 40 minutes.

This **six-monthly maintenance** guarantees the good operating of the air cushion which can be compromised by dust and Lucite present on the glass and which accumulates in the holes obstructing the passage of air generated by the fans.

PREPARATION OF THE MACHINE

When one operates on the machine to clean the air cushion holes, it is compulsory:

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[8]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.

REMAINING RISKS

Falling off the table during the hole cleaning phase.
Inhaling dusts.

Individual protection devices to be used:

- Protective glasses.
- Mask.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Free all the holes for the passage of air using a drill and a 4.5 [mm] diameter helicoid point.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Turn the fans on for a few minutes to help the dirt go out, after which clean the felt.

[8] Consult section **E- Exclusion-restoration of energy** in this manual.

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Cleaning of grinding dust suction filter on EASY DELETION optional

I-007

Estimated maintenance time 10 minutes.

On the cutting tables having the optional of the removal of the low emissive named "**EASY DELETION"**, there is mounted a dust suction system which allows to eliminate the waste produced by the grinding cycle. **The cleaning of the dust gathering tank and filter must be carried out monthly.**

PREPARATION OF THE MACHINE

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[9]

REMAINING RISKS

Inhaling grinding dusts.

Individual protection devices to be used:

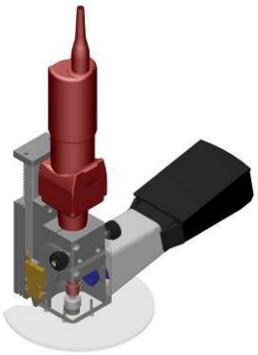
- Protective glasses.
- Mask.

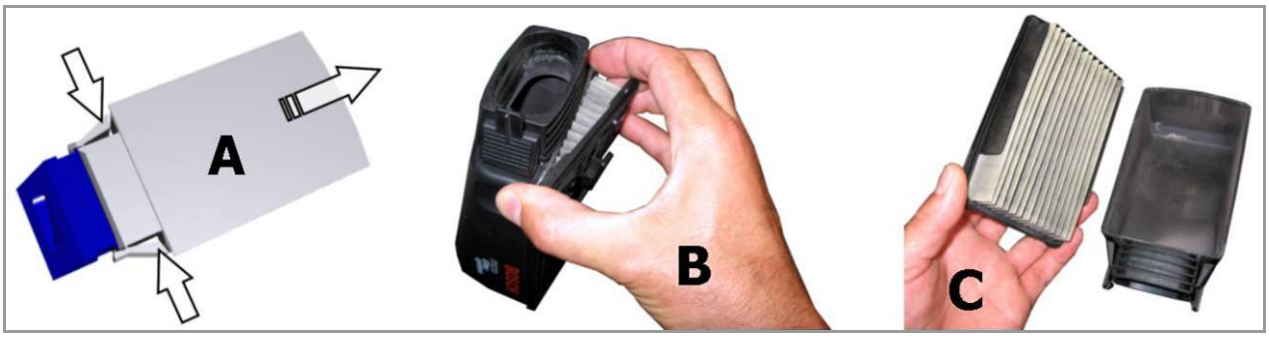
As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the suction filter mounted on the grinding unit.
- Press the two side hooks which attach the tank to the grinding unit. **[A]**
- Pull the tank out.
- Open the tank cover. **[B]**
- Empty the container. **[C]**
- Blow the paper filter with compressed air. **(in an aired place)**
- Reassemble the cover containing the filter.
- Insert the tank against the attachment base.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.





[9] Consult section **E- Exclusion-restoration of energy** in this manual.

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Cleaning of plate conveyer belts

I-008

Estimated maintenance time 30 minutes.

The perfect adherence of the conveyer belts on the plate surface keeps this from sliding during the glass transport phase to the cutting table.
The belts must be cleaned weekly.
If the glass loaded is strewn with much Lucite, it is necessary to intervene daily.

PREPARATION OF THE MACHINE

When operating on the machine to clean the conveyer belts, it is compulsory:

- To ensure that on the cutting table and **on all the machines in line with the cutting table there is no glass**.
- **To remove the electric and pneumatic energy to the machine.**[10]

REMAINING RISKS

Falling from cutting table.
Inhaling liquid used for cleaning the belts.
Using liquid substances.

Individual protection devices to be used:

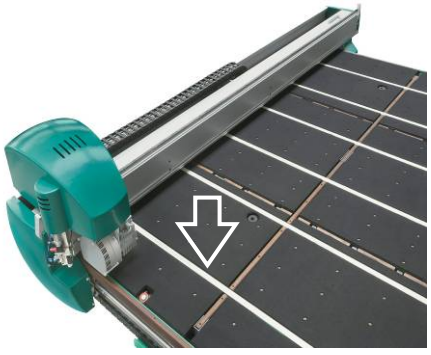
- Protective glasses.
- Mask.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Clean the conveyer belts with a dry antistatic cloth.[11]
- Place a piece of adhesive tape on one of the belts to be used as a reference point for the following operations.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy.**
- Carry out a belt rotation, by means of the plate call, until the adhesive tape reaches the opposite side of the table.
- Remove electrical and pneumatic energy.
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Clean the parts of the belts which have not yet been reached.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[10] Consult section **E- Exclusion-restoration of energy** in this manual.

[11] **It is forbidden to use** liquids of any type (alcohol, solvents, detergent etc.) in that they may ruin the belts or compromise their glass adherence features.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Emptying of rectification dust gathering tray

I-009

Estimated maintenance time 30 minutes.

On the cutting tables provided with low emissive removal, there is mounted a vacuum cleaner with a tray containing all the material removed during the grinding rectification phase. **The cleaning of the tray must be carried out six-monthly.**

PREPARATION OF THE MACHINE

When operating on the machine to clean the tray gathering the material removed from the grinding wheel, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[12]
- To provide oneself with a rubbish bag.

REMAINING RISKS

Inhaling rectification dusts.
Bumping the machine frame.

Individual protection devices to be used:

- Protective glasses.
- Protection mask.
- Protective helmet.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Go to the angle of the table where the vacuum cleaner is placed.
- Unhook the tray ❶, pull it out ❷ and empty its contents ❸ in a rubbish bag.
- Put the tray back into the vacuum cleaner.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

[12] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

PARTICULARS GREASING

Greasing bridge and trolley sliding guides

I-010

Estimated maintenance time 20 minutes.

Cleaning and greasing [13] these components are two of the most important maintenance operations for the correct operating of the cutting table as it guarantees a good movement of the axles of the machine and prevents jibs and breaking of moving items.
To not carry this maintenance out may cause breaking of the ball bearings and pinions and may compromise the cutting table tolerance. **The interval for greasing is weekly**.

PREPARATION OF THE MACHINE

When one operates on the machine to grease the bridge and trolley sliding guides, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To remove the electric and pneumatic energy to the machine.[14]

REMAINING RISKS

Bumping the table carpentry.
Inhaling products used for maintenance.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Protection mask.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Spray the **FIN SUPER (Interflon)** lubricant both on the guides and on the racks.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a pair of simulated cycles so that both the bridge and the trolley move along the whole length of the guides and gather the lubricant.

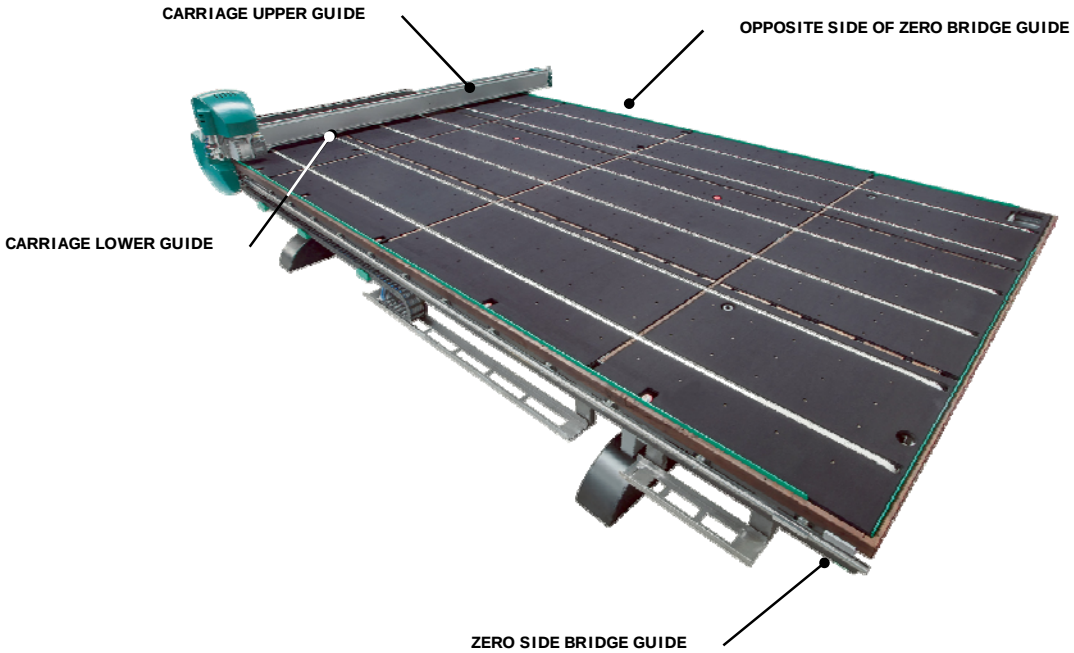
[13] Cleaning of the guides**, wheels and bridge and trolley sliding racks**

[14] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

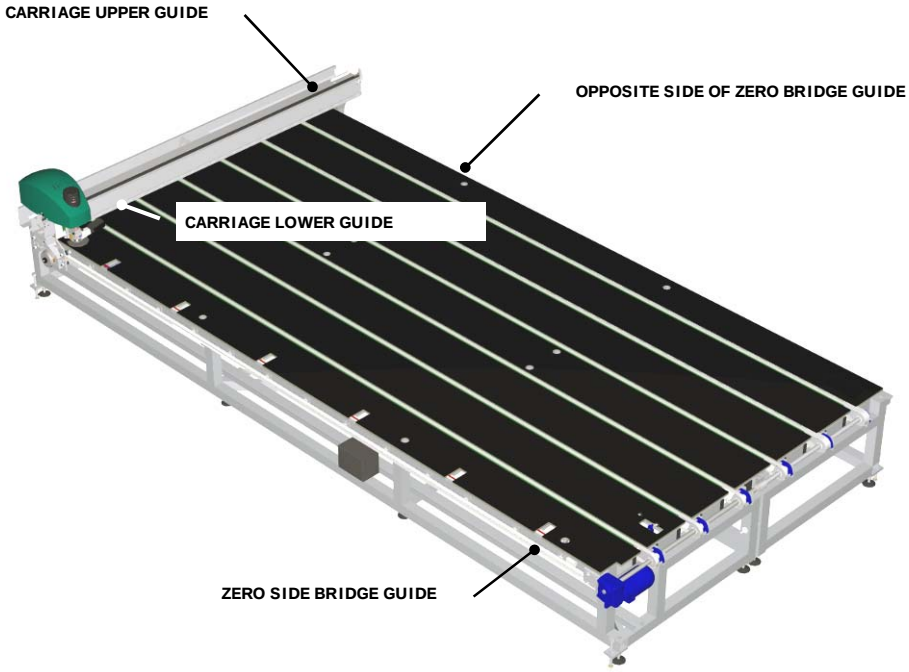
GUIDES TO BE LUBRICATED ON SERIES 352^{evo} TABLES

I-011



GUIDES TO BE LUBRICATED ON SERIES 340^{evo} TABLES

I-013



Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Greasing of bearings on cutting and grinding trolleys

I-012

Estimated maintenance time 10 minutes.

Greasing bearings for trolley movement prevents jibs and breaking of moving items. To not carry this maintenance out may cause breaking of the ball bearings and may compromise the cutting table tolerance. **The interval for greasing is weekly**.

PREPARATION OF THE MACHINE

When one operates on the machine to grease the trolley sliding bearings, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine**.[15]

REMAINING RISKS

Using liquid substances.

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

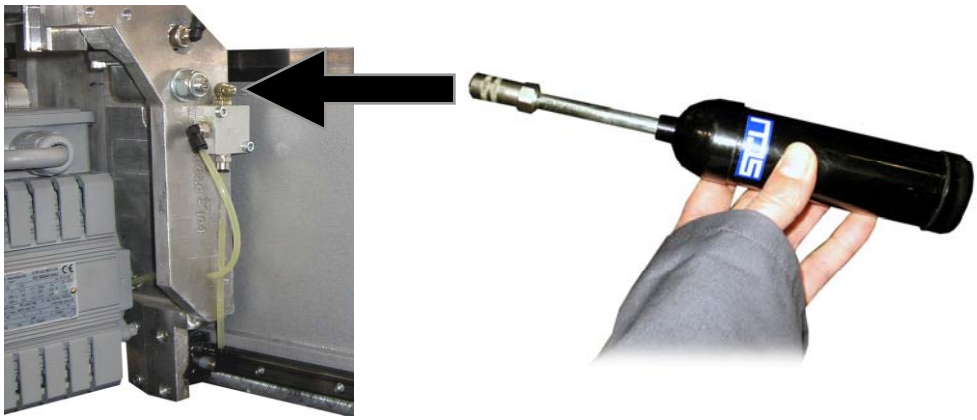
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Provide oneself with a small greasing pump **supplied with SKF LGMT3 grease.**
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the greaser on the trolley[16] and insert an amount of grease sufficient to expel the old grease from the bearing seat.

- Remove excess grease with a cloth.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a pair of simulated cycles so that the trolley moves along the whole length of the guides and gathers the lubricant.



[15] Consult section **E- Exclusion-restoration of energy** in this manual.

[16] Observe the photograph on the page.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Greasing of conveyer belt lifting shaft supports

I-013

Estimated maintenance time 15 minutes.

Despite the fact that these supports do not undergo excessive stress, it is advisable **to grease them every two years.**

PREPARATION OF THE MACHINE

When operating on the machine to grease the supports, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[17]

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

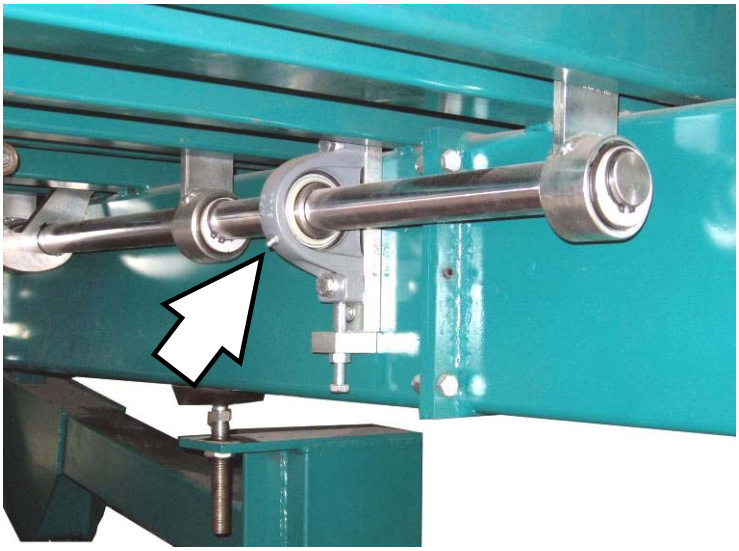
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Provide oneself with an appropriate greasing gun previously **supplied with SKF LGMT3 grease.**
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.

- Identify the greasers below the table panel and insert an amount of grease sufficient to expel the old grease from the bearing seat.
- Remove excess grease with a cloth.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[17] Consult section **E- Exclusion-restoration of energy** in this manual.

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Greasing of conveyer belt transmission shaft supports

I-014

Estimated maintenance time 15 minutes.

Despite the fact that these supports do not undergo excessive stress, it is advisable **to grease them every year.** The greasing, besides eliminating bearing friction, allows cleaning possible filth inside of them.

PREPARATION OF THE MACHINE

When operating on the machine to grease the supports, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[18]

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.
Falling from the table.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Provide oneself with an appropriate greasing gun previously **supplied with SKF LGMT3 grease.**
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.

- Identify the greasers[19] below the panel and on one side of the table and insert an amount of grease sufficient to expel the old grease from the bearing seat.
- Remove excess grease with a cloth.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

[18] Consult section **E- Exclusion-restoration of energy** in this manual.

[19] Images on the following page.

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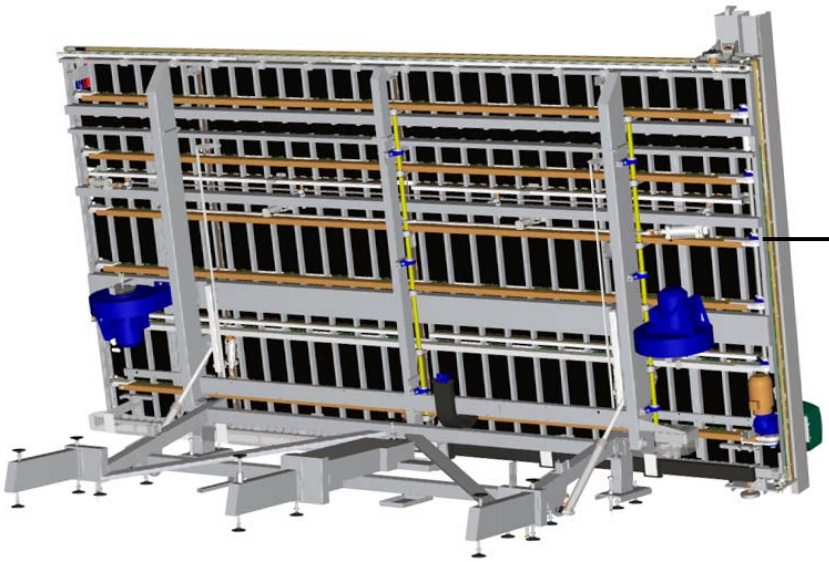
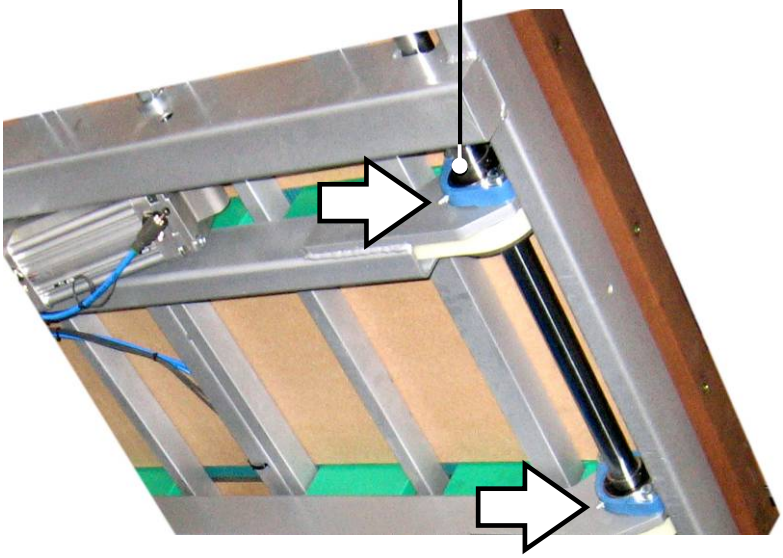
352BCS^{evo} AND 352LMT^{evo} CUTTING TABLES





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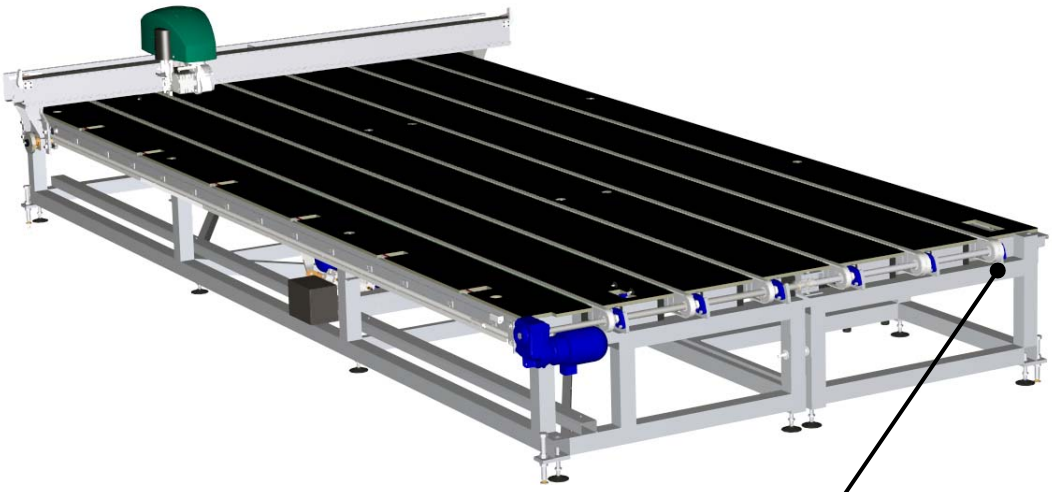
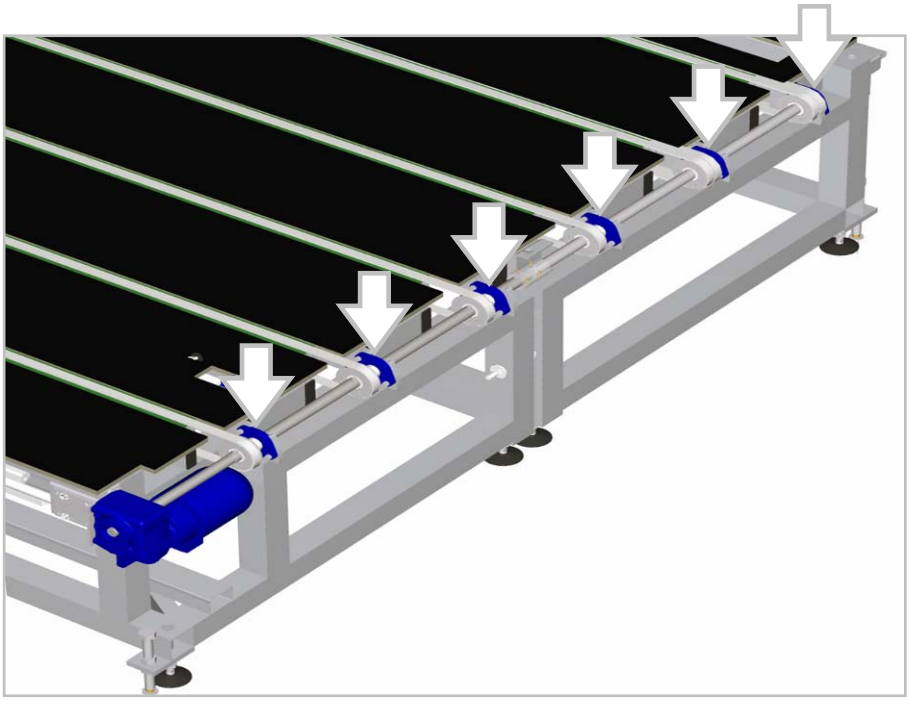
340BCS^{evo} AND 340LMT^{evo} CUTTING TABLES





Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Greasing of plate loading plug lever systems

I-015

For a correct movement of the plate loading plugs on 352BCS^{evo}-LMT^{evo} tables and of plate aligning plugs on 340BCS^{evo}-LMT^{evo} tables, it is advisable **to weekly grease** the lifting cams.

Estimated maintenance time 15 minutes.

PREPARATION OF THE MACHINE

When operating on the machine to grease the loading plugs, it is compulsory:

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[20]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

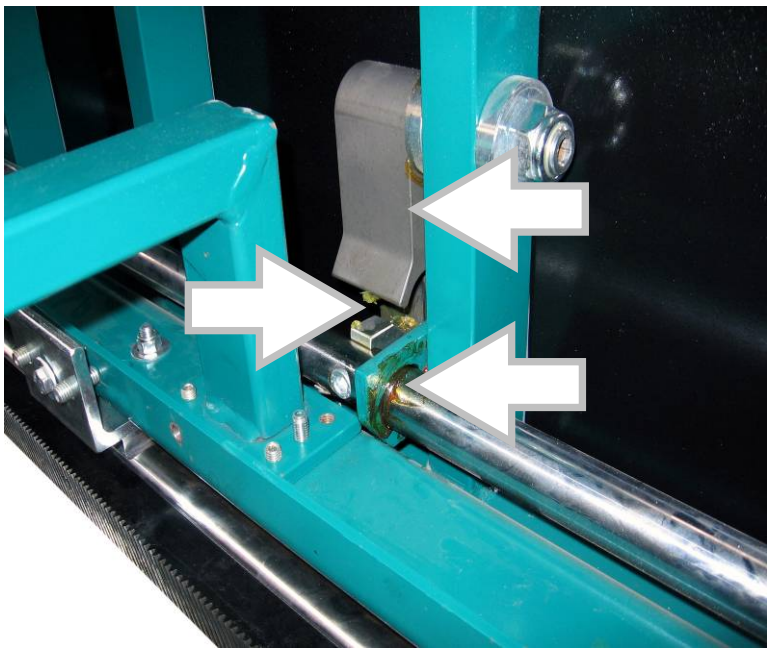
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the working areas** in this manual.
- Identify the cams that lift the plugs and strew the sliding surface with a layer of common grease.

- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[20] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Greasing of grinding wheel rotation gear

I-016

Estimated maintenance time 10 minutes.

The grinding unit mounted on the LMT tables is fixed to a fifth wheel coupled to a motor which transmits its rotation movement. The gear that carries out the rotation requires a **weekly greasing**.

PREPARATION OF THE MACHINE

When operating on the machine to grease the grinding fifth wheel movement, it is compulsory:

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[21]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To dismantle the carter that covers the grinding trolley.

REMAINING RISKS

Using liquid substances.

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

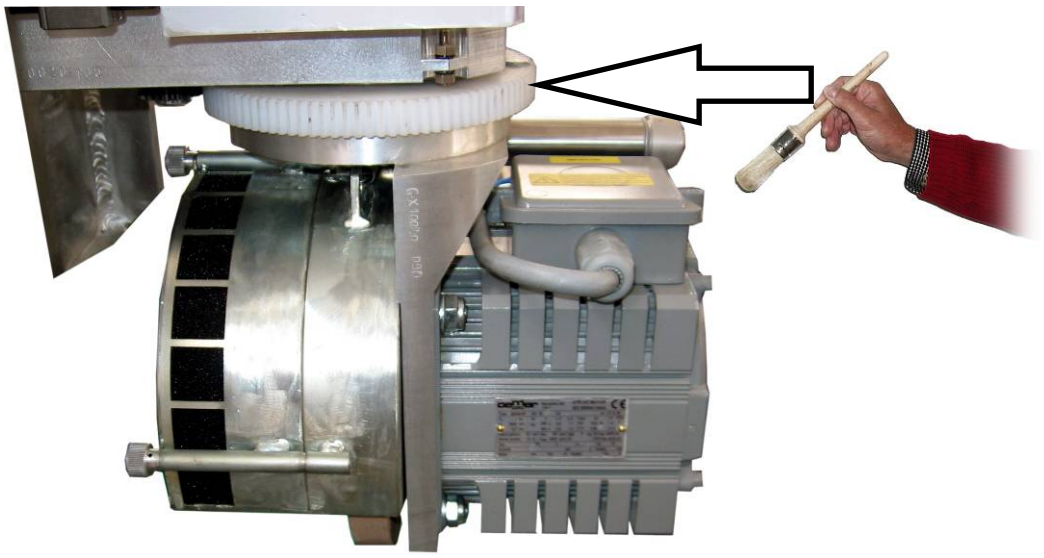
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- With a small soft bristle brush, spread common grease on the whole diameter of the gear.
- Reassemble the protection carter on the trolley.

- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[21] Consult section **E- Exclusion-restoration of energy** in this manual.

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Greasing of grinding unit ascent-descent guide

I-017

Estimated maintenance time 10 minutes.

The grinding unit mounted on the 352LMT^{evo}and 340LMT^{evo} tables moves by means of an electro-mechanical activator and slides on two high precision guides.
The sliding blocks which anchor the trolley guides must be **lubricated every two months** using the appropriate greasers.

PREPARATION OF THE MACHINE

When operating on the machine to grease the slide for the grinding ascent-descent movement, it is compulsory:

- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[22]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To dismantle the protection carter mounted on the grinding trolley.

REMAINING RISKS

Using liquid substances.

Individual protection devices to be used:

- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

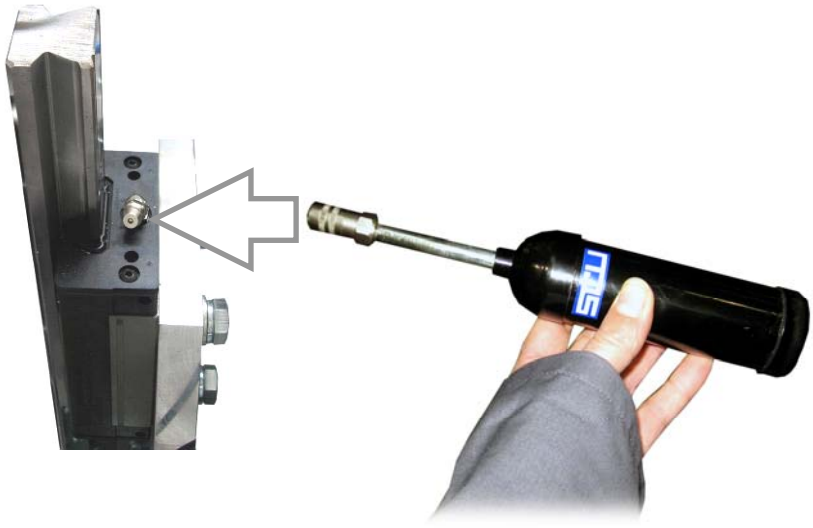
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the greasers which lubricate the sliding blocks. (see figure below)

- Provide oneself with a gun supplied by with **KLUBER MICROLUBE GL-261 grease.**
- Insert an amount of grease sufficient to expel the old grease from the slide seat.
- Remove excess grease with a cloth.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[22] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Greasing of cut running bar movements

I-018

Estimated maintenance time 10 minutes.

The cut running bars are inserted in the ertalon supports and move by means of pneumatic cylinders which act on a lever system. **These supports must be lubricated every two months.**

PREPARATION OF THE MACHINE

When operating on the machine to grease the cut running bar supports, it is necessary:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To lift the panel and to insert the safety tips.**
- **To remove the electric and pneumatic energy to the machine.**[23]

ATTENTION!
On the 352BCS^{evo} and 352LMT^{evo}model tables, one must operate with the panel high and therefore it is compulsory to insert the tips[24] which block the panel to the base before doing maintenance

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

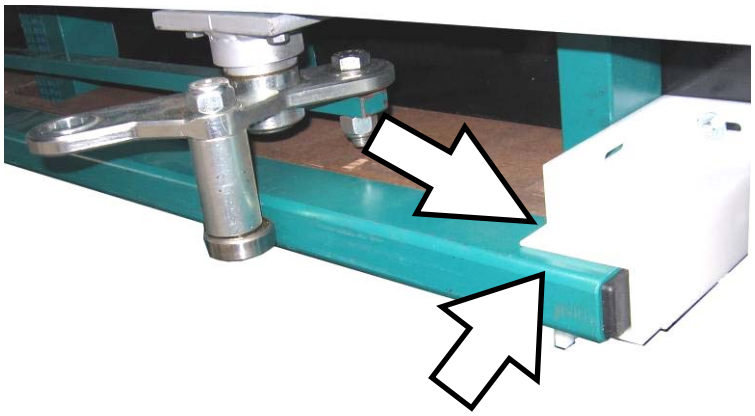
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Lift the cut running bars manually pushing them up.

- With a small soft bristle brush spread a coating of **SKF LGMT3 grease** on all the ertalon supports.
- Having finished the operation, remove the safety tips, leave the table working area making sure no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy**, restore the operator protection circuits and lower the table using the key on the control panel.



[23] Consult section **E- Exclusion-restoration of energy** in this manual.
[24] Consult subject on **page I-45**.

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Greasing of balancing items on 352BCS^{evo} and 352LMT^{evo} tables

I-019

The panel lifting system is surely a fundamental mechanical group of the balancing machines, and therefore it needs **an accurate and constant maintenance every two months**.
The balancing movement is carried out by means of two hydraulic cylinders which transmit their movement to the panel lifting it up.

PREPARATION OF THE MACHINE

When operating on the machine to grease the balancing items, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To lift the panel and to insert the safety tips.**
- **To remove the electric and pneumatic energy to the machine.**[25]

ATTENTION!
This type of operation must be carried out with the panel high. It is compulsory to insert the safety[26] tips which block the panel at the base before doing maintenance.

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Lift the panel using the key on the pulpit control panel.
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the greasers shown in the following images and indicated with the arrows.
- With a grease gun previously supplied with **SKF LGMT3**grease, insert an amount of lubricant sufficient to expel the old grease from the pin seat.
- Remove excess grease with a cloth.
- Having finished the operation, remove the safety tips, leave the table working area making sure no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy**, restore the operator protection circuits and lower the table using the key on the control panel.

[25] Consult section **E- Exclusion-restoration of energy** in this manual.
[26] Consult subject on **page I-45**.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

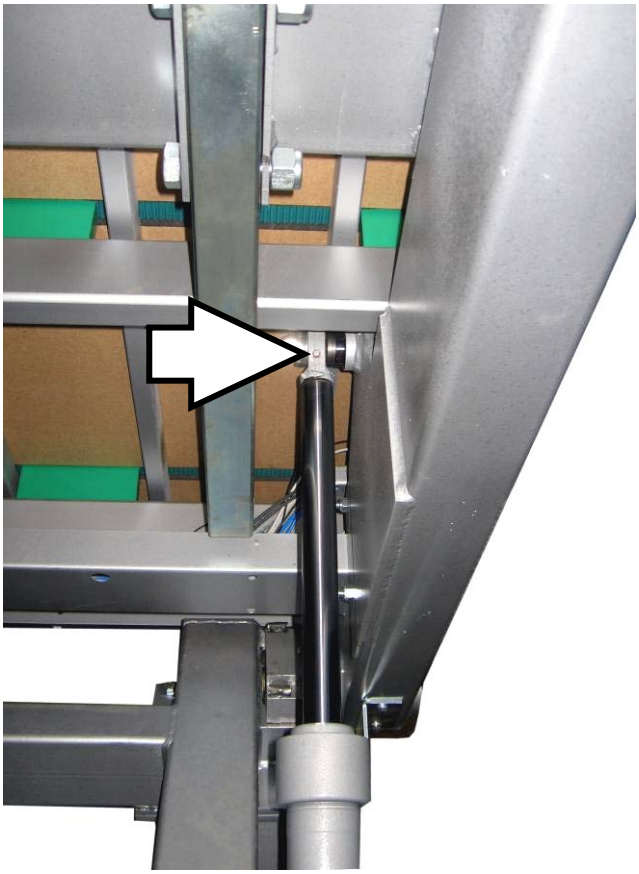
Particulars to be greased

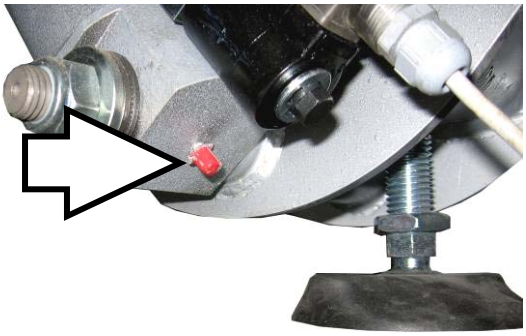
352BCS^{evo} and 352LMT^{evo} cutting tables

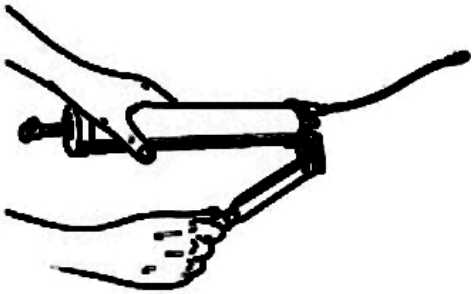
Estimated maintenance time 15 minutes.

Cylinder Hinging.

The points displayed in the images at the side indicate the greasers situated on the hydraulic cylinders.
These are for lubricating the cylinder hinging pins with the panels and the base.







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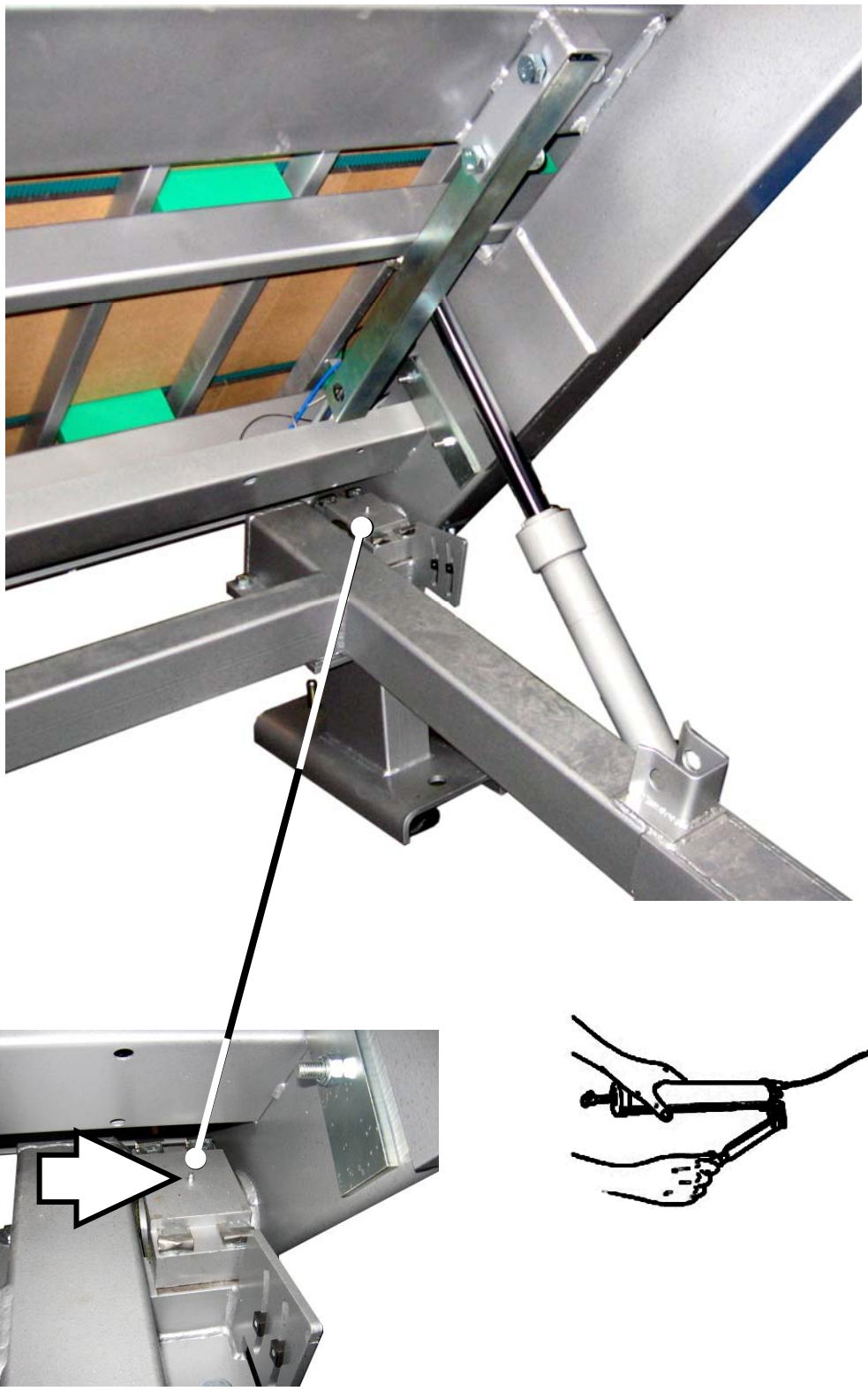
Panel Hinging.

The point displayed in the image indicates the greaser on the panel hinging bush.



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Greasing of plate alignment group on 340BCS^{evo} and 340LMT^{evo} tables

I-021

Estimated maintenance time 15 minutes.

The plate alignment plugs and the shaft supports that carry out their movement **require a yearly greasing.**

PREPARATION OF THE MACHINE

When operating on the machine to grease the plug movement, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine**. [27]

REMAINING RISKS

Bumping the table carpentry.
Using liquid substances.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

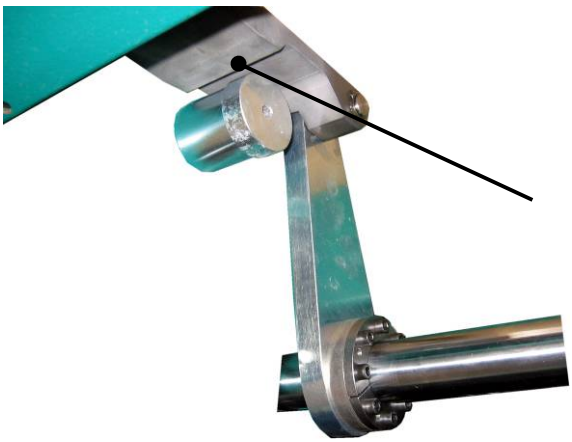
- Adequate clothing.
- Accident prevention shoes.

GREASING OF CAMS

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the location of the alignment plugs.

- Clean the cam; grease the cams upon which the concealed plug slides using a brush and placing some **SKF LGMT3** grease on the base of the cam itself.
- Having finished the operation, make sure that no one is inside the machine working area, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[27] Consult section **E- Exclusion-restoration of energy** in this manual.

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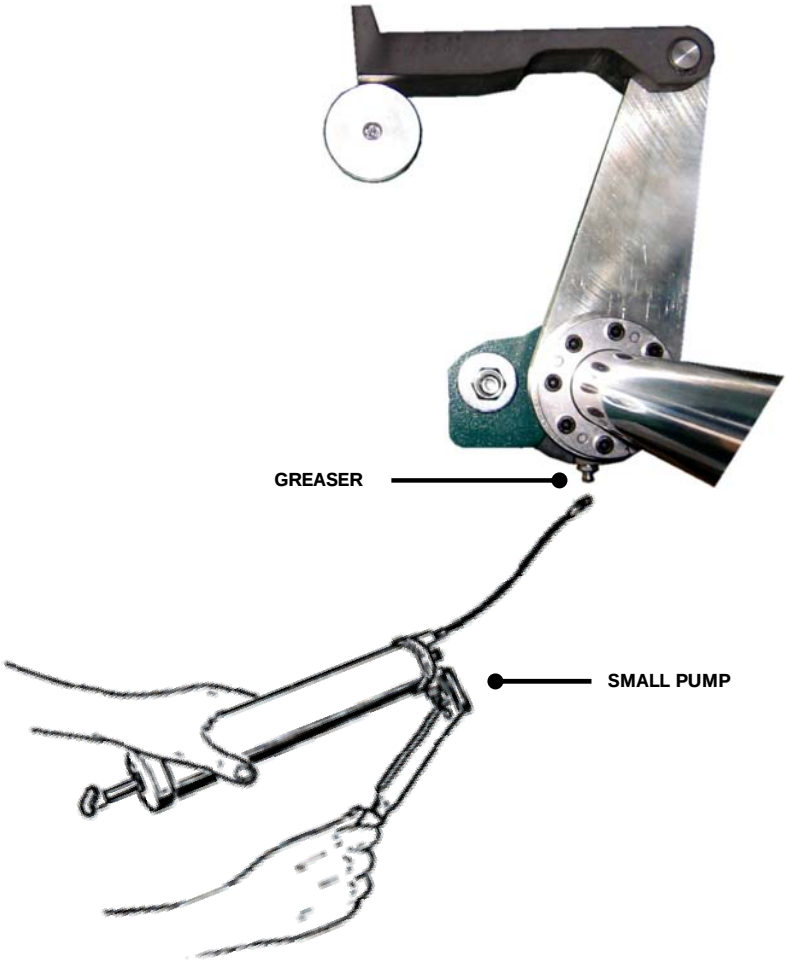
GREASING OF SUPPORTS

The supports, upon which the shaft that carries out the plug movement is fixed, **require a yearly greasing.**
The operation must be carried out with a grease gun previously supplied with **SKF LGMT3 grease**.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the greasers installed on the cam rotation shaft supports.

- Insert an amount of grease sufficient to expel the old grease from the bearing seat.
- Remove excess grease with a cloth.
- Having finished the operation, make sure that no one is inside the machine working area, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

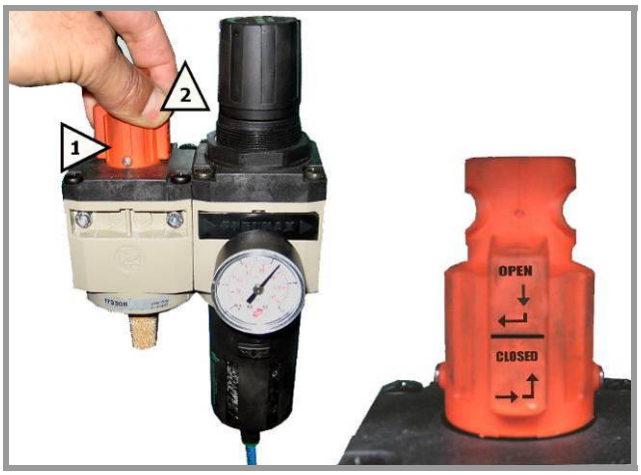
MACHINE CHECKS

General air filter group check

I-022

Estimated maintenance time 15 minutes.

The modular groups for treatment of compressed air have a filter group with a condensation release tap with an automatic unloading device and therefore they do not require a check for the presence of condensation in the machine plant.
A yearly maintenance to be carried out on the air filter group consists of cleaning and checking the state of the filtering cartridge inside of the waste collection cup.



PREPARATION OF THE MACHINE

When operating on the machine to check the air filter group, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[28]

REMAINING RISKS

Using compressed air.

Individual protection devices to be used:

- Protective glasses.

As well as:

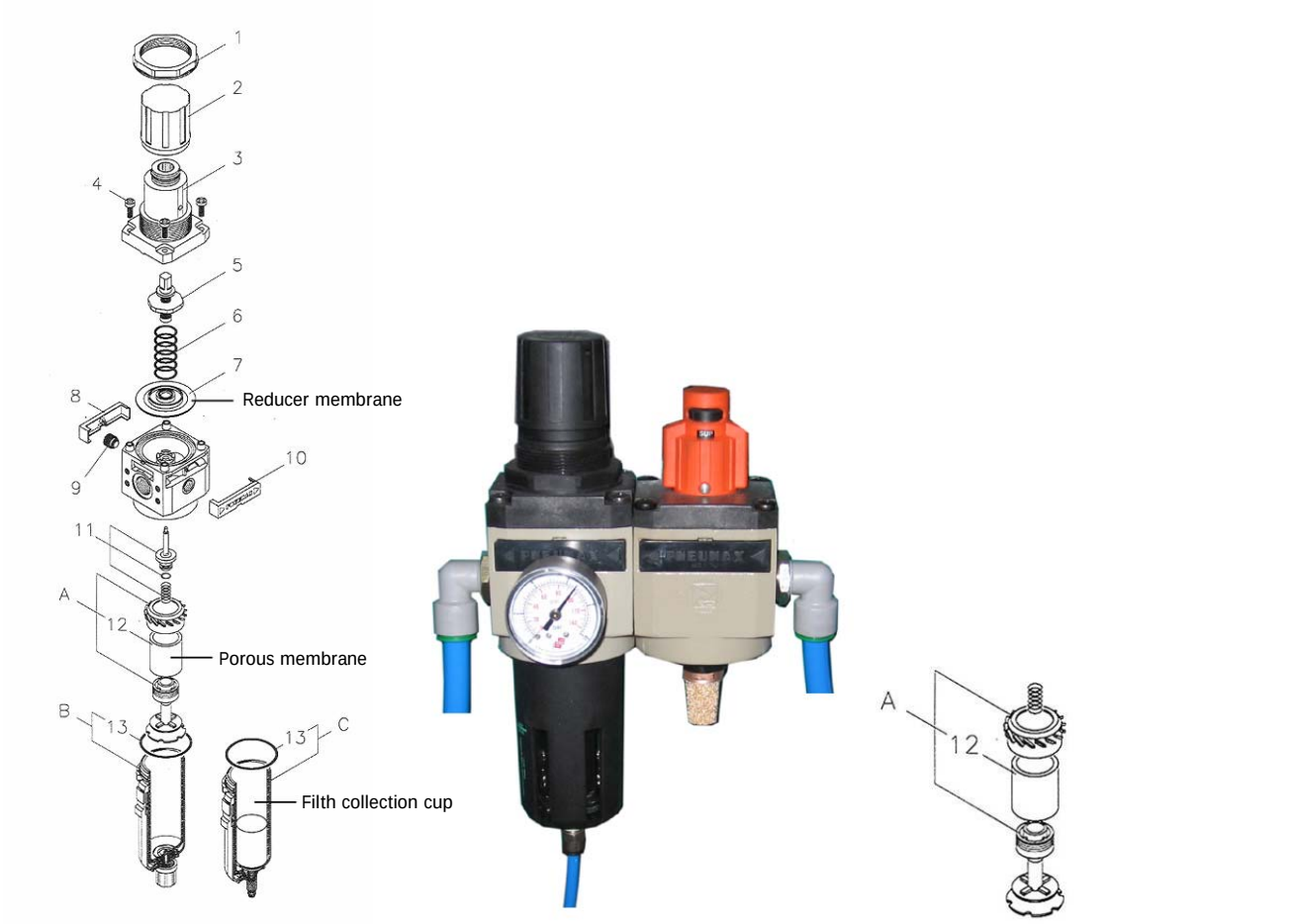
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

[28] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Access the electrical control board and locate the air group placed on the side.
- Open the protection carter and unscrew the cup underneath the filter group anti-clockwise.
- Clean the filtering part (porous membrane) using a neutral detergent or simply a compressed air jet. (use protective glasses)
- Replace the reducer membrane whenever it no longer works regularly or there should be a continuous leak from the overpressure unload.
- Reassemble the regulation support blocking it with about a nr. 8 torque.



Position	Pneumax Code	Description
A-12	R/1703/26	Porous Membrane 5µ

- Having finished the operation, close the carter and make sure that no one is inside the machine working area, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

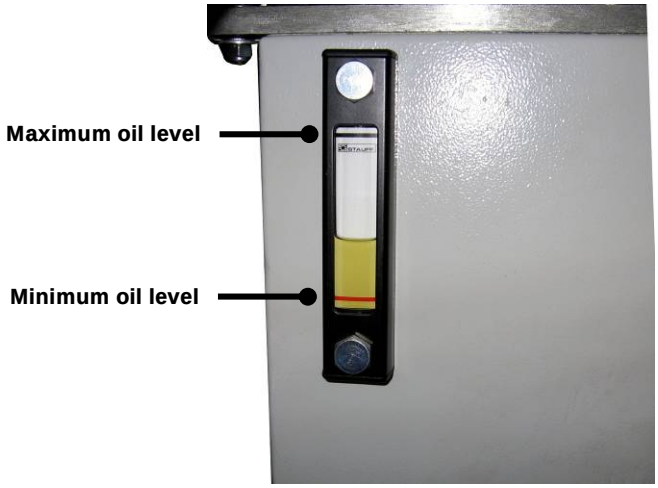
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Hydraulic board oil level check for the balancing table

I-023

Estimated maintenance time 15 minutes.

Every month the operator must check the amount of lubricant contained inside the board by means of **the oil level indicator** on one side of the board.



PREPARATION OF THE MACHINE

When operating on the machine to check or to replace the board oil, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To lift the panel and to insert the safety tips.**
- **To remove the electric and pneumatic energy to the machine.**[29]

ATTENTION!
This type of operation must be carried out with the panel high. It is compulsory to insert the safety[30] tips which block the panel at the base before the check.

REMAINING RISKS

Bumping the table carpentry.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Check that the oil level of the hydraulic board, by means of the appropriate indicator placed on the side of the board, is in between the black and red colours.
- If necessary carry out the top-up, consulting the subject treated in this manual.
- Having finished the operation, remove the safety tips, leave the table working area making sure no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy**, restore the operator protection circuits and lower the table using the key on the control panel.

[29] Consult section **E- Exclusion-restoration of energy** in this manual.
[30] Consult subject on **page I-45**.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Conveyer belt transmission reducer check

I-024

Estimated maintenance time 5 minutes.

Weekly check to see if there are oil leaks in the reducer which transmits rotation movement to the conveyer belts and that there are no variations in temperature or noise.
Check the clamping of the screws at the end of the running-in period and then every 2000 hours of work.
Monthly check the correct closing of the top-up and unloading lubricant caps.
Every six months carry out an accurate external cleaning of the reducer, to remove filth which could deposit in time and which limits the heat dissipation capacity.

PREPARATION OF THE MACHINE

When operating on the machine to check if there is an oil leakage from the reducer, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[31]

REMAINING RISKS

Bumping the table carpentry.

Individual protection devices to be used:

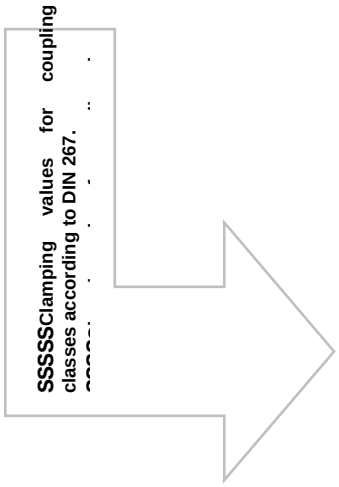
- Protective helmet.

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the type of motor-reducer displayed on the following page.
- Check if there is any oil leakage from the reducer[32].
- Having finished the operation, leave the machine working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[31] Consult section **E- Exclusion-restoration of energy** in this manual.

[32] If there is oil leakage from the reducer, contact the Bottero technical assistance.

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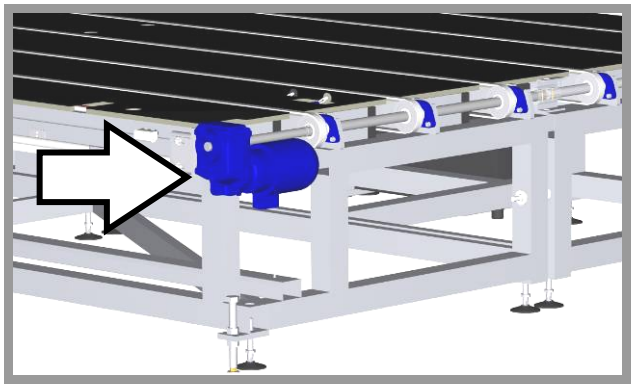
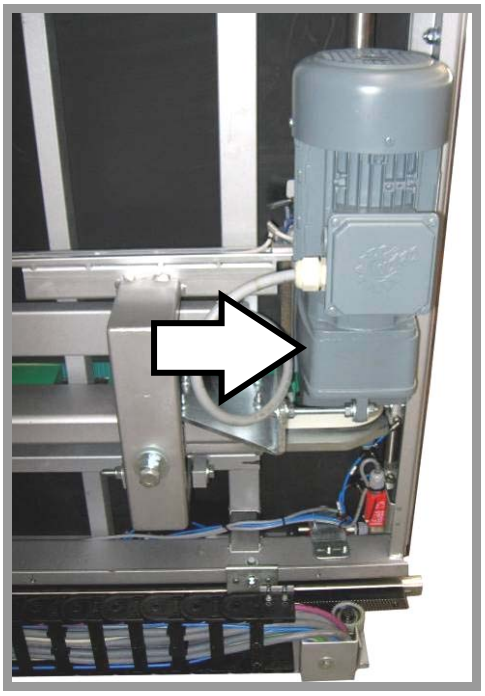
These reducers are supplied with synthetic oil and do not need any maintenance.
Actually these reducers are without service caps to check the amount of oil.
Periodically check that there are no visible leaks in the rolling and static seals of the reducer; should they be verified, **immediately stop the machine and contact the Bottero S.p.A. technical assistance service**

340BCS^{evo} - 352LMT^{evo} TABLE CONVEYER BELT ROTATION



352BCS^{evo} - 352LMT^{evo} TABLE CONVEYER BELT ROTATION



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Glass conveyer belt tensioning check

I-025

Estimated maintenance time 30 minutes.

A good operating of a conveyer belt transmission is connected to the right assembly tension.
The “TENSION MEASURER" is found to be in these cases an essential and practical instrument, able to manually check in a few moments the correct tensioning of the conveyer belts.

PREPARATION OF THE MACHINE

When operating on the machine to check the conveyer belt tensioning, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine**[33] .

REMAINING RISKS

Bumping the table carpentry.

Individual protection devices to be used:

- Protective helmet.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section of this instruction manual **D-Access to the operative items.**
- **Use a TENSION MEASURER and follow its instructions for use.**
- Having finished the operation, leave the machine working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

[33] Consult section **E- Exclusion-restoration of energy in this manual.**

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Pneumatic plant condition check

I-026

Estimated maintenance time 20 minutes.

Pneumatic plant

To ensure the perfect operation of the cutting table, it is advisable to do a **yearly check** of the conditions and state of all the tubes, pneumatic fittings and of the electrovalves present on the frame.
If air leaks can be felt near the quick coupling fittings their replacement is advised.
If the leak continues, replace the air tube. The electrovalves are gathered on the tubular structure.
The plant check must be carried out yearly.

PREPARATION OF THE MACHINE

When operating on the table to check the pneumatic plant, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To lift the panel and to insert the safety tips.**
- **To remove the electric and pneumatic energy to the machine.**[34]

ATTENTION!

This type of operation must be carried out also with the panel high. It is compulsory to insert the safety[35] tips which block the panel at the base before the check.

REMAINING RISKS

Bumping the table carpentry.
Compressed air.

Individual protection devices to be used:

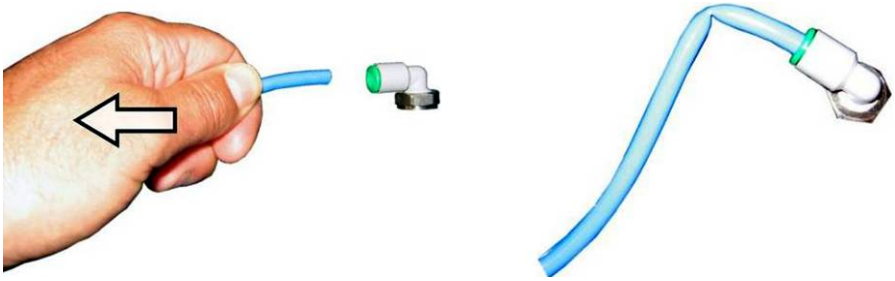
- Protective helmet.
- Protective glasses.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Check that all the pneumatic components and above all the tubes are well inserted in the fittings, that they are not bent or squeezed, and have no cuts or holes.
- Carefully check the length of all the tubes, including those inside the conduits.
- To control the fittings and anchoring, lightly pull the tube out of the fitting and make sure that it remains well anchored.
- Having finished the operation, remove the safety tips, leave the table working area making sure no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy**, restore the operator protection circuits and lower the table using the key on the control panel.



[34] Consult section **E- Exclusion-restoration of energy** in this manual.

[35] Consult subject on **page I-45**.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Plate resting-alignment plug condition check

I-027

Estimated maintenance time 5 minutes.

Despite being made of an anti-cut component, the plate resting-alignment material is subject to wear and therefore it is necessary in time to replace it.
To correctly operate it is advisable to carry out a **monthly visual check of the state of the material**.
If the material is considered deteriorated, consult the subject "**L-Replacement of plate resting-alignment plugs**".

PREPARATION OF THE MACHINE

When operating on the machine to check the plug conditions, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[36]

REMAINING RISKS

This operation does not present any remaining risks.

Individual protection devices to be used:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Check the conditions of the material on the plugs.
- Having finished the operation, leave the machine working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

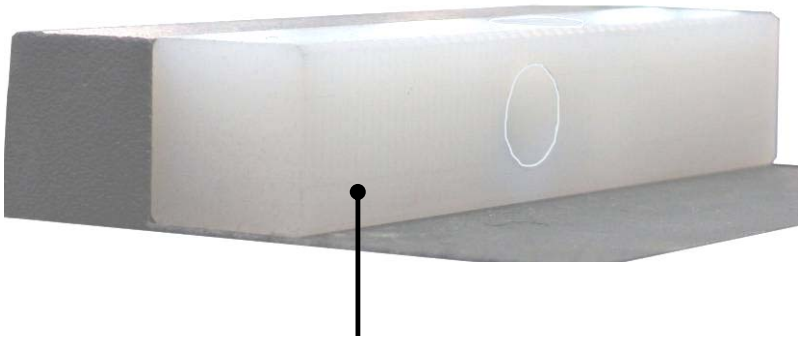
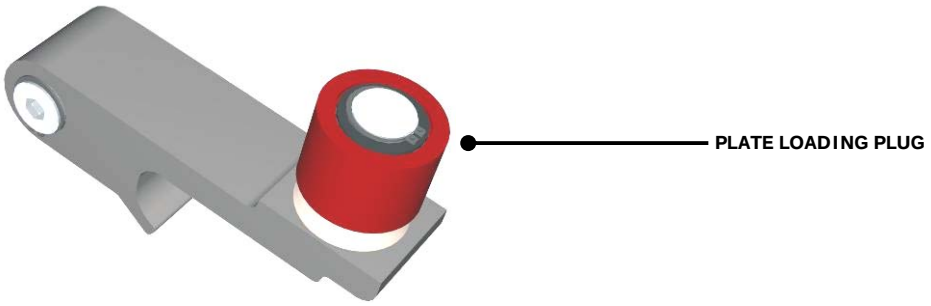


PLATE ALIGNMENT PLUG



[36] Consult section **E- Exclusion-restoration of energy** in this manual.

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Cutting bridge diagonal check

I-028

Estimated maintenance time 20 minutes.

Every six months it is necessary to check that the cutting bridges have maintained the 2 millimetre tolerance [37] on the cutting diagonals on a maximum dimension of a **rectangle area > than 2 mq**.

PREPARATION OF THE MACHINE

When operating on the machine to check the bridge diagonal tolerance, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- To position four pieces of glass of at least 400x400 millimetres on the table [38] using anti-cut gloves.

REMAINING RISKS

Glass movement.

Individual protection devices to be used:

- Protective glasses.
- Five finger anti-cut gloves.

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- From the main program display one must go to the **Manual controls** menu, by means of the **F10 function key**.
- Select the function **Diagonal calibration.**
- Bring the machine to the simulated cycle using the F12 key. (icon with yellow background)
- Press the cycle key on the control panel. Using the simulated cycle, memorise the positions on which we must then place the four pieces of glass.
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual, and position the glass on the table.
- Check the correct positioning of the glass following the instructions listed above.
- Remove the simulated cycle and carry out the incision on the glass. (green icon)
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual, and measure the diagonals produced by the cutting cycle.

[37] 0.079 In.

[38] 15.748 In.

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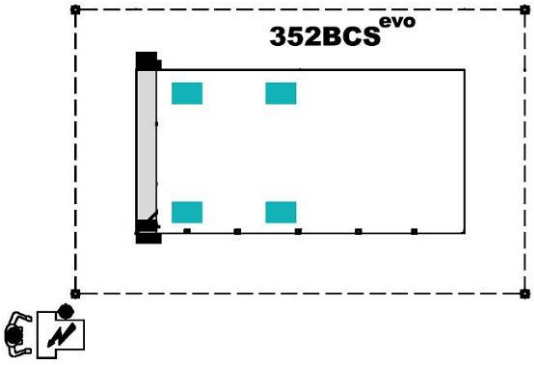
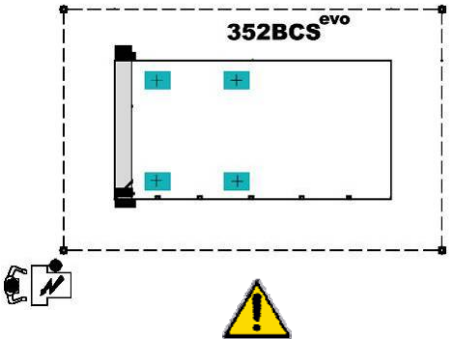
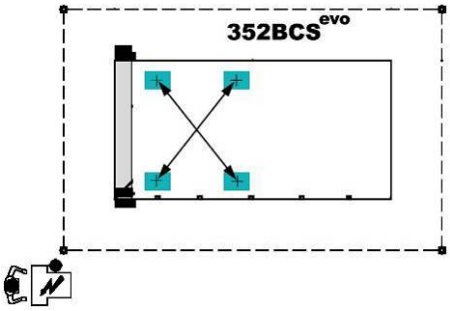
EXAMPLE ON 352BCS^{EVO} MACHINE

Once the four pieces of glass are correctly positioned on the table, one must:





1. Bring the simulated cycle key back to cutting cycle position[39] and press the cutting cycle key placed on the control panel.
2. The machine will carry out the incision. Having ended the cycle, the cutting bridge will return to its original zero position.



3. Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
4. With the help of another person, measure the diagonals on the four cross cuts on the glass and verify if the machine has maintained the tolerance[40] required by the machine specifics.
5. Having finished the operation, leave the machine working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

NOTE:

If necessary, repeat the simulated cycle to correct the glass disposition error.

If the diagonals of the cutting bridge are not within the required tolerance, contact the Bottero technical assistance, phoning +39 0171310611.

[39] Green key.

[40] The maximum error on the cycle that we have carried out must be 1 millimetre.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Plate stop-presence end run condition check

I-029

Estimated maintenance time 5 minutes.

The plate stop-presence end run presents on its upper part a small spherical head which, despite being made of anti-cut material, is subject to wear in time.
Therefore it is necessary to **visually check every six months the material layer.**

PREPARATION OF THE MACHINE

When operating on the machine to check the end run small head conditions, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[41]

REMAINING RISKS

This operation does not present any remaining risks.

Individual protection devices to be used:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Locate the hole inserted in the cutting table that takes the plate stop-presence end run.
- Check the conditions of the material that carries out the operation of plate stop-presence sensor.
- If the material is suitable, leave the machine working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

NOTE:

Should the material be considered deteriorated, consult the subject "L-Replacement of the plate stop-presence end run small spherical head".

[41] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

REPLACEMENTS

Cutting oil filter replacement

I-030

Estimated maintenance time 15 minutes.

Yearly it is necessary to replace the filth gathering filter of the cutting oil mounted under the protection carter.

PREPARATION OF THE MACHINE

When operating on the machine to replace the cutting oil filter, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[42]
- To remove the protection carter from the cutting trolley.

REMAINING RISKS

Oil use.

Individual protection devices to be used:

- Protection glasses.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Remove the filter, unhooking the quick fittings which connect it to the lubricating tube.
- Mount the new filter exactly in the same position as the one replaced[43].
- Reassemble the protection carter previously removed.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Check the lubrication so as to avoid the formation of air bubbles caused by changing the oil filter.[44]

42 Consult section **E- Exclusion-restoration of energy** in this manual.

43 An arrow indicates the oil direction.

44 Consult section **"F- Machine use"** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of the filter for collecting grinding dusts on 352LMT ^{evo} table

I-031

Estimated maintenance time 20 minutes.

On the 352LMT^{evo} cutting table a suction system is mounted which allows eliminating waste produced by the grinding cycle. This waste gets trapped inside of a filtering element mounted in the grinding unit carter.

NOTE:

The replacement of the filtering material must be done when during a grinding cycle one notices a worsening in the fan suction force with the consequent release of the grinding dusts on the glass.

PREPARATION OF THE MACHINE

When operating on the machine to replace filtering material, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[45]
- To provide oneself with a rubbish bag.
- Three strips of filtering material[46].

REMAINING RISKS

Inhaling grinding dusts.

Individual protection devices to be used:

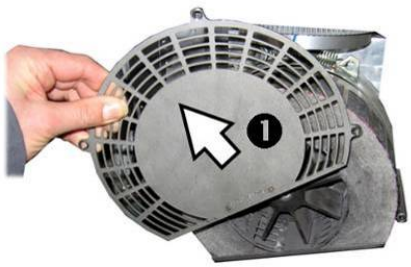
- Protective glasses.
- Protection mask.

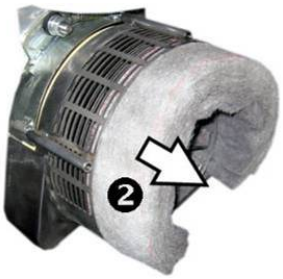
As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Reach the grinding unit mounted on the machine trolley.
- Remove the grinding wheel protection cover ❶ loosening the screws that block it.
- Slowly remove the filtering material ❷ trying to avoid spreading the accumulated dusts.
- Throw the material into a rubbish bag.
- Insert the three layers of filtering material ❸ in the grinding wheel carter.
- Reposition the grinding wheel carter cover and close fastening the screws well.
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.





[45] Consult section **E- Exclusion-restoration of energy"** in this manual.

[46] Consult the machine spare parts manual.

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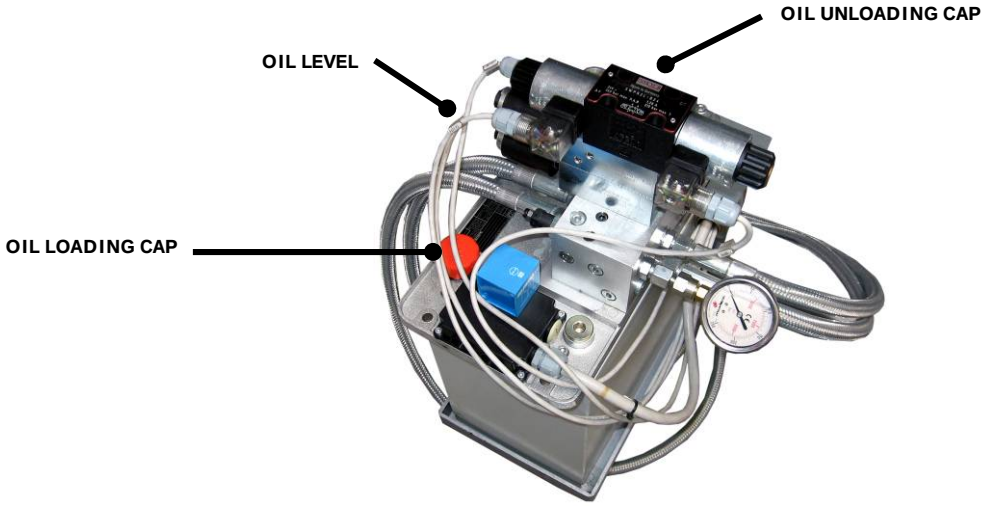
Replacement of balancing table hydraulic board oil

I-032

Estimated maintenance time 45 minutes.

Replacement of oil in the hydraulic board must be carried out every 2000 hours of work.
By means of the "**Statistics**"[47] function of the machine management software, it is possible to check this datum.
It is advisable anyhow to replace it every 2 years of machine life.



PREPARATION OF THE MACHINE

When operating on the machine to replace the board oil, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To carry out a balancing of the table.
- **To lift the panel and to insert the safety tips.**
- **To remove the electric and pneumatic energy to the machine.**[48]

ATTENTION!
This type of operation must be carried out with the panel high. It is compulsory to insert the safety[49] tips which block the panel at the base before doing maintenance.

REMAINING RISKS

Bumping the table carpentry.
Hot oil movement.

Individual protection devices to be used:

- Protective helmet.
- Protective glasses.
- Heat-resistant gloves.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

47 Key combination **CTRL+F6**.
48 Consult section **E- Exclusion-restoration of energy** in this manual.
49 Consult subject on **page I-45**.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Loosen the screws ❶ which attach the board to the table base.
- Move the board so that the unloading cap comes out of the board resting plate.
- Place a container beneath the board to recuperate the oil.
- Unscrew the unloading cap placed on a side of the board and remove it.
- Wait for the oil to completely empty from the board.
- Close the unloading cap well.
- Unscrew the oil loading cap placed on the upper part of the board.
- Fill once again the board with oil[50] **to the maximum level** shown by a black line.
- Close the loading cap.
- Having finished the operation, remove the safety tips, leave the table working area making sure no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy**, restore the operator protection circuits and lower the table using the key on the control panel.

Board fixing screws at the base

NOTE:

IT IS IMPORTANT NOT TO DISPERSE USED OIL IN THE ENVIRONMENT, BUT TO USE THE PROVIDED ITEMS TO RECUPERATE USED OIL.

[50] Consult the subject **"Hydraulic board oil table"**

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Insertion of safety tips on 352BCS^{evo} e 352LMT ^{evo} balancing tables

I-033

Estimated operation time‘10 minutes.

This operation requires the presence of at least three people, two to centre the tips and one to control the ascent and descent of the cutting table.

PREPARATION OF THE MACHINE

When you operate on the machine to insert the safety tips, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To lift the table.

REMAINING RISKS

Bumping the table carpentry.

Individual protection devices to be used:

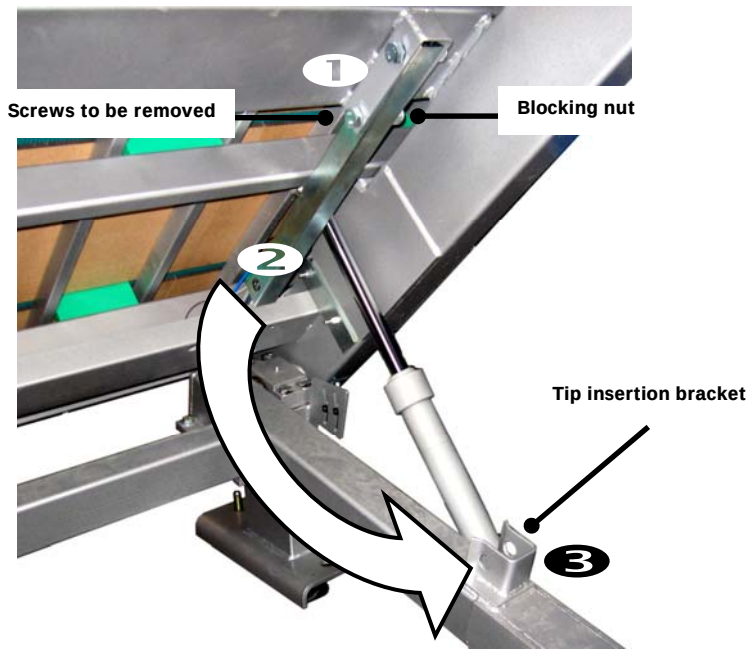
- Protective helmet.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Remove the lower ❶ fixing screws of the two tips to the table.
- Lower the tips ❷ and incline them in correspondence with the bracket ❸ welded to the table base.
- Adjust the inclination[51] of the table so as to centre the tip hole with the bracket hole.
- Insert the screws previously removed in the bracket holes and tighten the blocking nuts.
- Having finished inserting the tips, leave the table working area and **remove pneumatic and electrical energy from the machine.**[52]



[51] Use the keys on the control panel.

[52] Consult section **E- Exclusion-restoration of energy** in this manual.

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CUTTING MACHINE BOLTS AND SCREWS CLAMPING

Bolt and screw clamping of cutting table components

I-034

Estimated maintenance time 60 minutes.

Yearly it is necessary to check the clamping of the bolts and screws which compose the machine, in that, the vibrations it undergoes, could compromise it. **It is advisable to carry out a check on all bolts and screws installed.**
The clamping must be carried out respecting the clamping couple values **[Nm]** and pre-load **[N]** indicated in the present table in the instruction manual, proportional values to the dimension of the bolts and screws.

It is also important to check all the bolts and screws which make up the machine accessories, that is:

1. Machinery ground fixing plugs.
2. Photocell barriers.
3. Metallic barriers.

In the following pages we will indicate **the main locations** where to check the clamping of the bolts and screws present on the single machines. In the following images the control points are indicated of all the machine models described in this instruction manual.
Remember as well that a check of the nuts and bolts or of the components of the machinery, is to be carried out on all parts of the machine.

PREPARATION OF THE MACHINE

When operating on the machine to check the bolts and screws clamping, it is compulsory:

- To reset the axles of the machine.
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.**[53]

REMAINING RISKS

Bumping the table carpentry.
Use of mechanical utensils.

Individual protection devices to be used:

- Protective helmet.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section of this instruction manual **D-Access to the operative items.**
- Reach the particulars suggested by the numbering placed at the side of the images and check the bolt and screw clamping.
- Once the intervention is terminated, restore the energy to the machine following the operations described in the **E-Energy exclusion-restoration** section and restore the operator protection circuits.

[53] Consult section **E- Exclusion-restoration of energy** in this manual.

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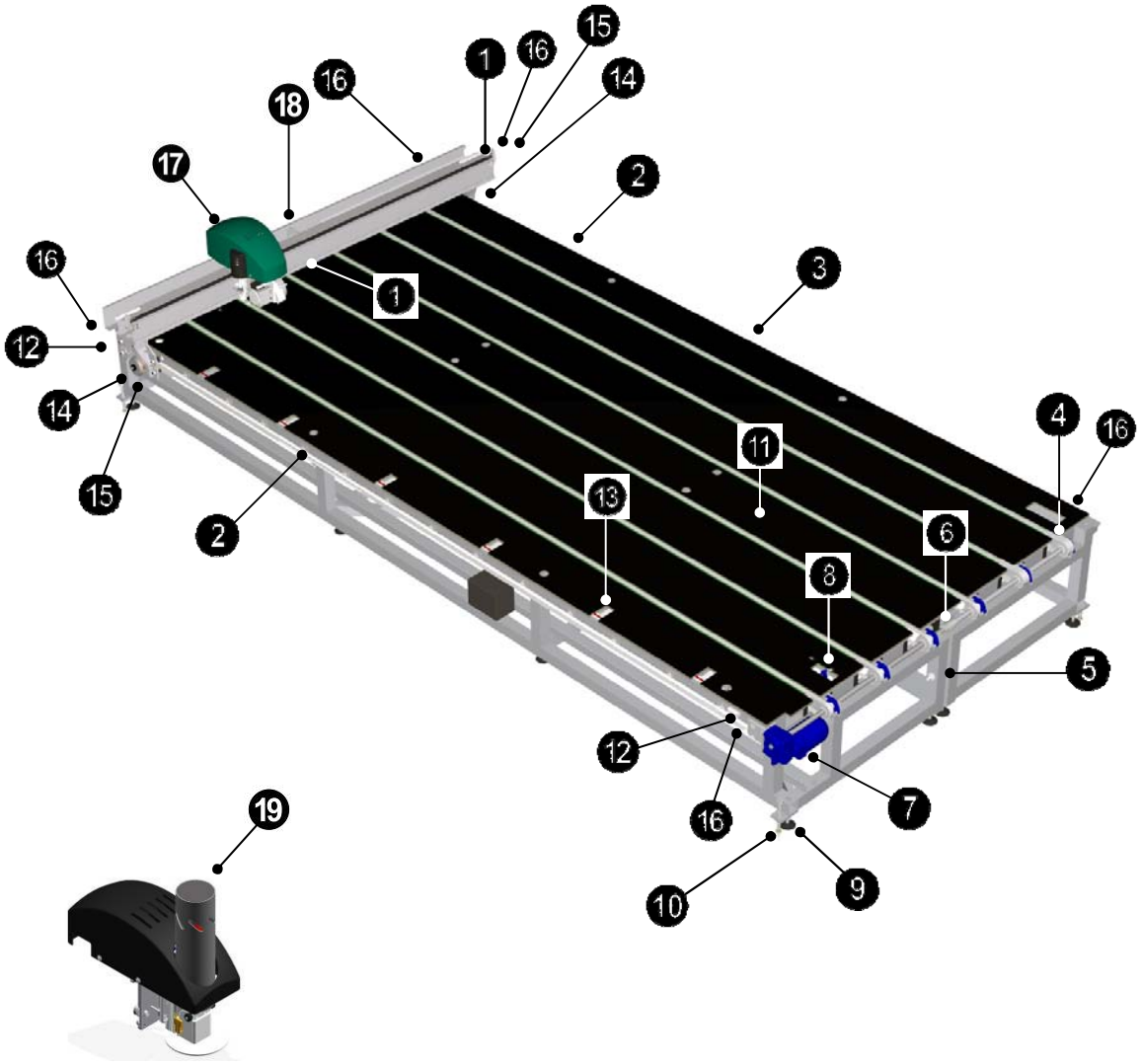
340BCS AND 340LMT EVOLUTION TABLES



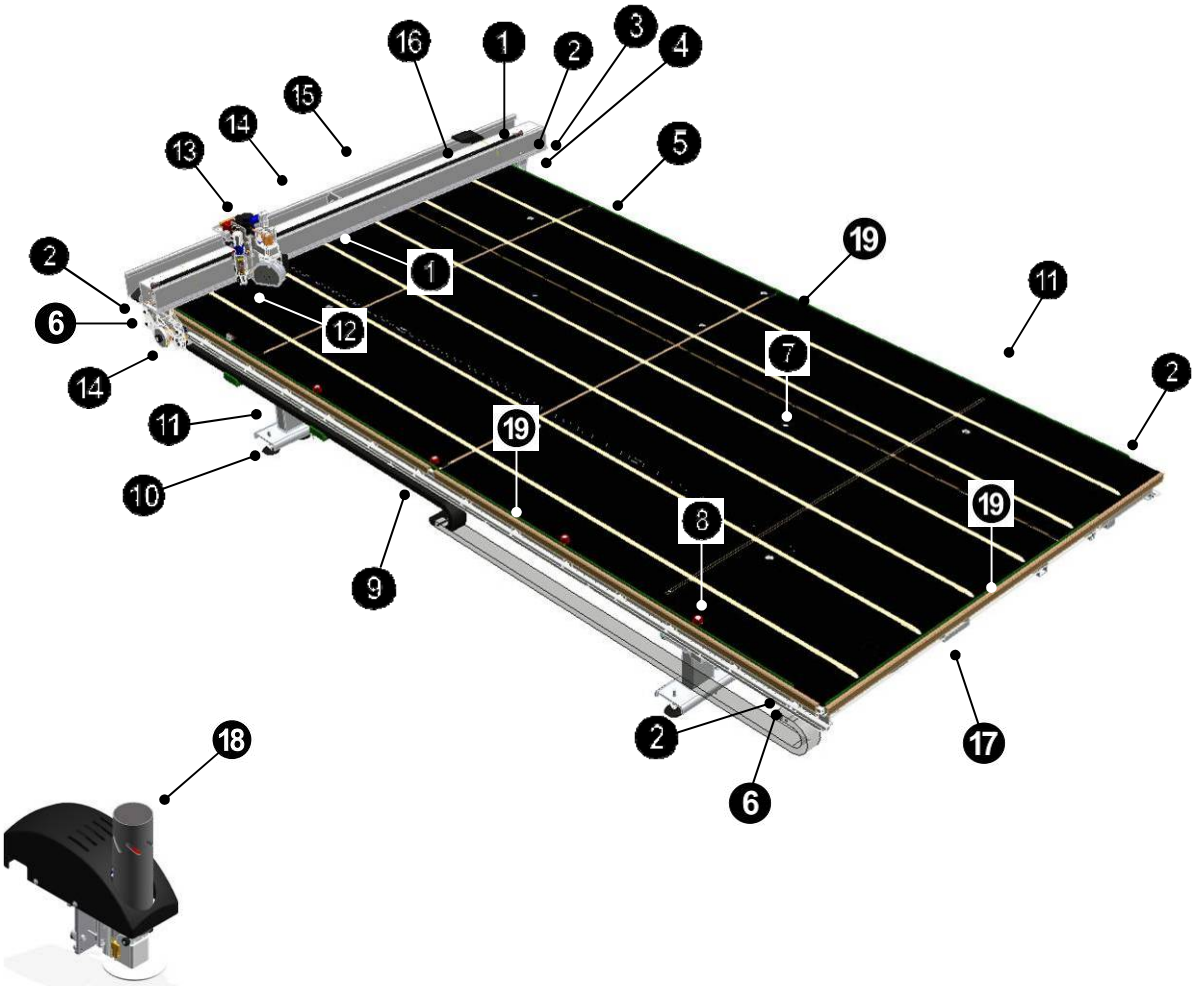
1	Trolley sliding guides	11	Conveyer belt frame lifting group
2	Cutting bridge sliding guides	12	Safety and bridge zero brackets
3	Bridge cable support chain	13	Plate alignment plug group
4	Conveyer belt transmission group	14	Bridge transmission shrink disks
5	Frame junction	15	Eccentrics on bridge heads
6	Transmission shaft junction	16	Bridge buffers
7	Motor-reducer group	17	Grinding and cutting trolley group
8	Plate stop end run	18	Trolley cable support chain
9	Ground feet lock nuts	19	Easy Deletion grinding unit(optional on 340 BCS)
10	Machine clamping to the ground		

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

352BCS AND 352LMT EVOLUTION TABLES

ATTENTION!

Some of these checks must be carried out with the panel high. It is compulsory to insert the safety[54] tips which block the panel at the base.



1	Trolley sliding guides	11	Machine clamping to the ground
2	Bridge buffers	12	Plate stop end run sensor
3	Eccentrics on bridge heads	13	Grinding and cutting trolley group
4	Bridge transmission shrink disks	14	Conveyer belt transmission group
5	Cutting bridge sliding guides	15	Transmission shaft junction
6	Safety and bridge zero brackets	16	Trolley cable support chain
7	Plate-pusher group	17	Conveyer belt frame lifting group
8	Plate loading plug group	18	Easy Deletion grinding unit(optional on 340 BCS)
9	Bridge cable support chain	19	Concealed safety bank group
10	Ground feet lock nuts		

[54] Consult subject on **page I-45**.

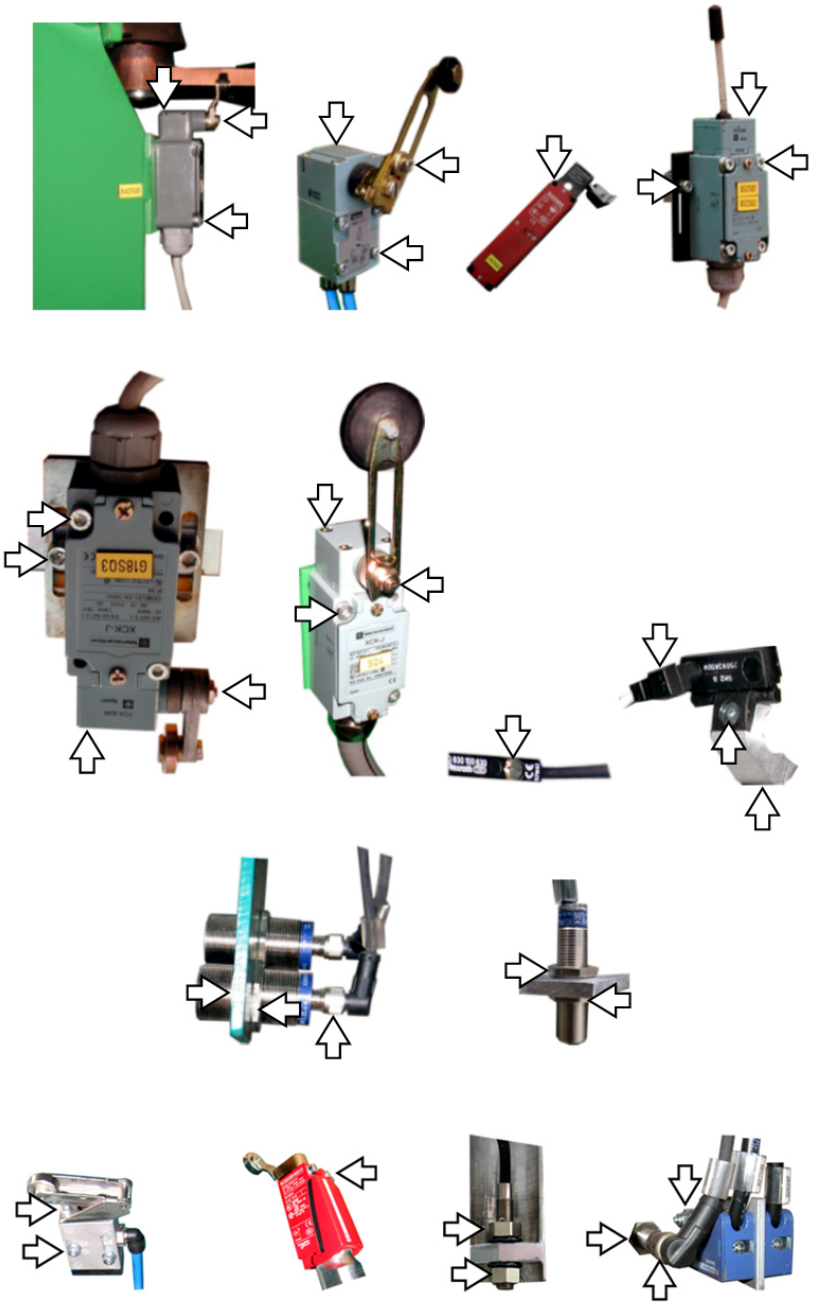
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Proximity, photocells and end run sensor clamping check

I-035

While checking the clamping of the bolts and screws of the cutting machine components, do not forget to check the clamping of all the control devices present on the machine, that is: **end-run, proximity and photocells.**
Check the correct clamping of the screws, that they are working, clean and that the electric cables are not worn.

The operations to be carried out safely are the same as the ones mentioned in the previous pages.



ATTENTION!

Some of these checks must be carried out with the panel high. It is compulsory to insert the safety[55] tips which block the panel at the base.

[55] Consult subject on **page I-45**.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Table of non binding clamping coupl Nm (Newton metres)

I-036

Clamping values for coupling classes according to DIN 267.

M	Thread friction coefficient						Test couples for hex keys for embedded hexagon screws.							
	4.6	5.6	6.9	8.8	10.9	12.9	mm	No. 2, 2A, 2B No. 1B, 308, 7	No. 4	No. 6, No. 1B, 7, 400	No. 25	No. 26 R No. 626	No. 35 A No. 35 B No. 3112	No. 894 No. 895
M 2	0,123	0,162	0,314	0,373	0,520	0,628	4			1,90				
M 2,2	0,196	0,265	0,510	0,598	0,843	1,010	4,5*			2,64				
M 2,5	0,284	0,373	0,726	0,863	1,206	1,451	5			3,55				
M 3	0,441	0,588	1,128	1,344	1,883	2,256	5,5			4,64		14,4		2,32
M 3,5	0,677	0,902	1,736	2,060	2,893	3,481	6*	17,6	7,4	5,92		17,6		2,96
M 4	1,000	1,344	2,599	3,040	4,315	5,148	7	25,2	11,4	9,12		25,2		4,56
M 5	1,916	2,648	5,099	6,031	8,483	10,200	8 9*	34,5 45,4	16,6 23	13,3 18,4		34,5 45,4	34,5 45,4	6,65 9,20
M 6	3,432	4,511	8,728	10,300	14,710	17,652	10	58,1	31	24,8	58,1	58,1	58,1	12,4
M 7	5,590	7,453	14,220	17,162	24,517	28,439	11 12	72,7 89,1	40,4 51,5	32,3 41,2	72,7 89,1	72,7 89,1	72,7 89,1	16,1 20,6
M 8	8,238	10,787	21,575	25,497	35,304	42,168	13 14*	107 128	64,5 79,4	51,6 63,5	107 128	107 128	107 128	25,8 31,7
M 10	16,67	21,575	42,168	50,014	70,608	85,317	15 16 17	150 175 201	96,2 115 134	77,0 92,3 107	150 175 201	150 175 201	150 175 201	38,5 46,1 53,5
M 12	28,44	38,246	73,550	87,279	122,60	147,10	18 19* 20*	230 261 294	160 186 215	128 149 172	230 261 294	230 261 294	230 261 294	64,0 74,5 86,0
M 14	45,11	60,801	116,70	138,30	194,20	235,40	21 22* 23*	330 368 408	247 281 319	198 225 255	330 368 408	330 368 408	330 368 408	99,0 112 127
M 16	69,63	93,163	178,5	210,80	299,10	357,90	24 25* 26*	451 496 544	359 402 449	287 322 359	451 496 544	451 496 544	451 496 544	143 161 179
M 18	95,12	127,50	245,20	289,3	411,90	490,30	27 28*	594 647	499 552	399 442	594 647	594 647	594 647	199 221
M 20	135,3	180,45	384,10	411,90	578,60	696,30	30	760	670	536	760	760	760	268
M 22	182,4	245,16	470,70	559,00	784,50	941,40	32* 34	884 1019	804 951	643 761	884 1019	884 1019	884 1019	321 381
M 24	230,5	308,91	598,20	711,00	1000	1196	36	1165	1117	894	1165	1165	1165	447
M 27	343,2	460,90	887,50	1049	1481	1775	41	1579	1442	1154	1579	1579	1579	577
M 30	465,8	622,72	1206	1422	2010	2403	46	2067	1816	1453	2067	2067	2067	726
M 33	632,5	848,30	1628	1932	2716	3266	50	2512	2145	1716	2512	2512	2512	858
M 36	814,0	1089	2099	2481	3491	4197	55	3140		2077	3140	3140	3140	1038
M 39	1059	1412	2716	3226	4531	5443	60	3849		2471	3849		3849	1235
M 42	1304	1746	3364	3991	5609	6727	65	4021		2900	4021		4021	1422
M 45	1638	2177	4207	4992	7012	8414	70	4658		3364	4658		4658	1618
M 48	1981	2638	5080	6021	8473	10150	75	5394		3862			5394	1765
M 52	2540	3393	6541	7747	10885	13092	80	6178		4394			6178	1912
M 56	3168	4227	8149	9650	13582	16279	85	6963					6963	2059
M 60	3932	5247	10101	11964	16867	20202	90	7845					7845	-
M 64	4737	6306	12160	14416	20300	24320	95	8336					8336	-

***These measurements are not considered by the DIN ISO RULE 272.**
Clamping values for coupling classes according to DIN 267.

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Lubricant table 1

I-037

		MINERAL OIL			SYNTHETIC OIL			
ISO VG		**460**	**320**	**220**	**460**	**320**	**220**	**150**
Environment TEMPERATURE [°C]		5° ÷ 45°	0° ÷ 40°	-5° ÷ 35°	-10° ÷ 100°	-15° ÷ 90°	-25° ÷ 80°	-30° ÷ 70°
SUPPLIER	ARAL	Degol BG 460	Degol BG 320	Degol BG 220	Degol GS 460	Degol GS 320	Degol GS 220	Degol GS 150
	BP	Enerol GRXP 460	Enerol GRXP 320	Enerol GRXP 220	Enerol SGXP 460	Enerol SGXP 320	Enerol SGXP 220	Enerol SGXP 150
	ESSO	Spartan EP 460	Spartan EP 320	Spartan EP 220				
	IP	Mellana OIL 460	Mellana OIL 320	Mellana OIL 220		IP Telium VSF Oil 320		IP Telium VSF Oil 150
	KLÜBER	Lamora 460	Lamora 320	Lamora 220	Syntheso D460 EP	Syntheso D320 EP	Syntheso D220 EP	Syntheso D150 EP
	MOBIL	Mobilgear 634	Mobilgear 632	Mobilgear 630	Glygoyle 80 SHC634		Glygoyle 30 SHC630	
	SHELL	Omala Oil 460	Omala Oil 320	Omala Oil 220	Tivela Oil SD	**Tivela Oil SC**	Tivela Oil WB	Tivela Oil SA
	TEXACO	Meropa 460	Meropa 320	Meropa 220	Symlube CLP 460	Symlube CLP 320	Symlube CLP 220	
	CASTROL	Alpha SP 460	Alpha SP 320	Alpha SP 220	Alpha Synt 460		Alpha Synt 220	Alpha Synt 150

Lubricant table 2

I-040

	6) °C -50 0 +50 +100	DIN (ISO)	ISO,NLGI	Mobil®	Shell	Klüber	Aral	BP	Tribol	Texaco	Optimol	Fuchs
R...	Standard -10 +40	CLP(CC)	VG 220	Mobilgear 630	Shell Omala 220	Klüberoil GEM 1-220	Aral Degol BG 220	BP Energol GR-XP 220	Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220
K...(HK...)	-25 +80	CLP PG	VG 220	Mobil Glygolyle 30	Shell Tivela WB	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220	
	4) -40 +80	CLP HC	VG 220	Mobil SHC 630	Shell Omala 220 HD	Klübersynth EG 4-220	Aral Degol PAS 220		Tribol 1510/220	Pinnacle EP 220	Optigear Synthetic A 220	Renolin Unisyn CLP 220
	4) -40 +40		VG 150	Mobil SHC 629		Klübersynth EG 4-150				Pinnacle EP 150		
F...	-20 +25	CLP (CC)	VG 150 VG 100	Mobilgear 627	Shell Omala 100	Klüberoil GEM 1-150	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150
	-30 +10	HLP (HM)	VG 68-46 VG 32	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68	Aral Degol BG 46		Tribol 1100/68	Rando EP Ashless 46	Optigear 32	Renolin B 46 HVI
	4) -40 +10	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46		
	4) -40 -20	HLP (HM)	VG 22 VG 15	Mobil D.T.E. 11M	Shell Tellus T 15	Isoflex MT 30 ROT		BP Energol HLP-HM 10		Rando HDZ 15		
S...(HS...)	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 636	Shell Omala 680	Klüberoil GEM 1-680	Aral Degol BG 680	BP Energol GR-XP 680	Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680
	-20 +60	CLP PG	VG 680 1)	Mobil Glygoyle HE 680		Klübersynth GH 6-680		BP Enersyn SG-XP 680	Tribol 800/680	Synlube CLP 680		
	4) -30 +80	CLP HC	VG 460	Mobil SHC 634	Shell Omala 460 HD	Klübersynth EG 4-460				Pinnacle EP 460		
	4) -40 +10		VG 150	Mobil SHC 629		Klübersynth EG 4-150				Pinnacle EP 150		
	-20 +10	CLP (CC)	VG 150 VG 100	Mobilgear 627	Shell Omala 100	Klüberoil GEM 1-150	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 100	Optigear BM 100	Renolin CLP 150
	-25 +20	CLP PG	VG 220 1)	Mobil Glygoyle 30		Klübersynth GH 6-220			Tribol 800/220	Synlube CLP 220	Optiflex A 220	
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46		
R...,K...(HK...), F...,S...(HS...)	4) -30 +40	HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460	Aral Eural Gear 460				Optileb GT 460	
	-20 +40	E	VG 460			Klüberbio CA2-460	Aral Degol BAB 460				Optisynt BS 460	
W...(HW...)	Standard -20 +40	SEW PG	VG 460 2)			Klüber SEW HT-460-5						
	4) -40 +10	API GL5	SAE 75W90 (~VG 100)	Mobilube SHC 75 W90-LS								
	-20 +40	CLP PG	VG 460 3)			Klübersynth UH1 6-460						
R32 R302	-25 +60	DIN 51 818 5)	00	Glygoyle Grease 00	Shell Tivela Compound A	Klübersynth GE 46-1200				Multifak 6833 EP 00		
	Standard -15 +40		000 - 0	Mobilux EP 004	Shell Alvania GL 00		Aralub MFL 00	BP Energrease LS-EP 00		Multifak EP 000	Longtime PD 00	Renolin SF 7 - 041

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Oil table for hydraulic board

I-038

SUPPLIER	Viscosity	Specific
AGIP OSO 46	**Viscosity in Centistokes at 50 ° C 24 - 28**	**Specific DIN 51524 Part 2 – June 1979 H – LP 32**
IP Hydrus 46		
BP Energol HLP46		
CASTROL Hyspin AWS46		
ESSO Nuto H46		
MOBIL DTE 25		
SHELL Tellus 46		
CHEVRON EP 46		

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L

EXTRAORDINARY MAINTENANCE

SECTION SUMMARY

Foreword _____ L-3
Replacement of plate resting-alignment plugs present on 340BCS-LMT^{evo} tables _____ L-4
Replacement of plate resting-loading plugs present on 352BCS-LMT^{evo} tables _____ L-5
90 degree small cutting head regulation _____ L-6
Cutting bridge diagonal regulation _____ L-10
Regulation of small grinding wheel position on tables with Easy Deletion optional _____ L-12
Calibration of the glass detection photocell _____ L-14
Calibration of glass thickness encoder _____ L-18
Replacement of the mechanical fuse on the cutting head _____ L-20
Replacement of plate stop-presence end run spherical head _____ L-24
Replacing carriage extra-run rubber buffers _____ L-26
Replacing bridge extra-run rubber buffers _____ L-27

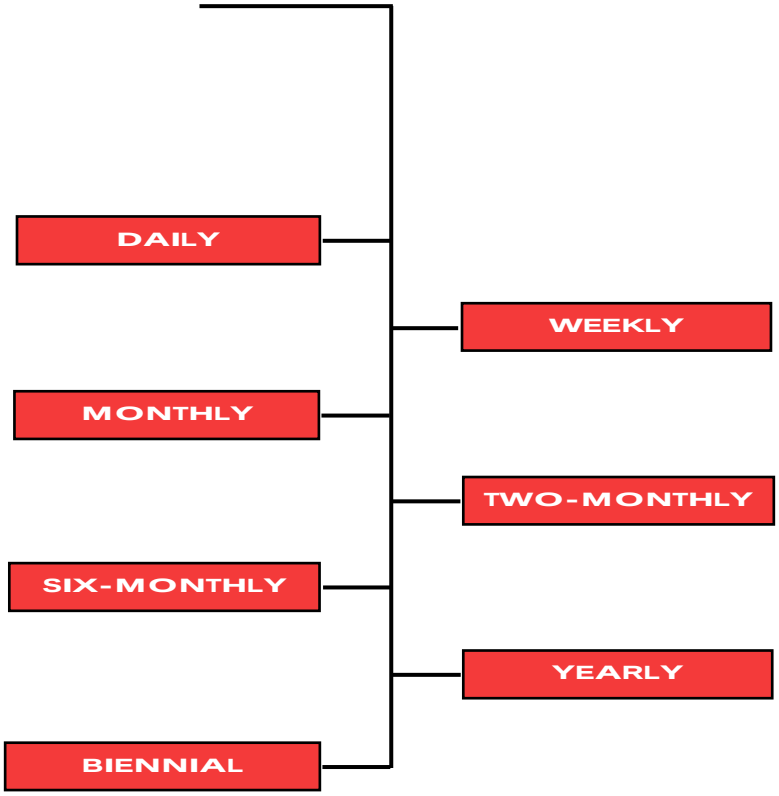
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Foreword

L-000

This section of the manual describes all the operations of **EXTRAORDINARY maintenance** to be carried out on the monolithic glass cutting tables **EVOLUTION model** manufactured by Bottero S.p.A.
These operations are only to be carried out during the time intervals described in the sections and **can only be carried out by adequately trained MAINTENANCE.**
If carried out or not, these operations can compromise the entire functioning of the machinery.
In case these operations are not carried out, **Bottero S.p.A. declines every type of responsibility** on the correct functioning of the machine, as well as the warranty on the damaged parts.
Remember that the operator or maintenance, before carrying out these operations, must also be completely **aware of the accident prevention rules and of the safety devices to use**; this chapter is intended for this purpose.
Also remember that **these operations must be** carried out without pieces of glass present on the machine and that the operator must **always position the machine on zero** before carrying out the procedures described in the following chapters.

The maintenance times vary depending on which part of the machine needs maintenance. The maintenance is subdivided in:



The various extraordinary maintenance operations will be described in a simple and intuitive manner and will **have to be carried out only by specialised personnel** following the instructions described in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of plate resting-alignment plugs present on 340BCS-LMT^{evo} tables

L-001

Estimated maintenance time 15 minutes.

The particulars which we will describe hereafter have the possibility of being rotated and reused.
After their first rotation, the plugs require total replacement.

PREPARATION OF THE MACHINE

When operating on the machine to carry out the rotation or replacement of plugs, it is compulsory:

- To reset the axles of the machine.
- Carry out the plug ascent using the machine software.[1]
- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- **To remove the electric and pneumatic energy to the machine.** [2]

REMAINING RISKS

Use of mechanical utensils.

Individual protection devices to be used:

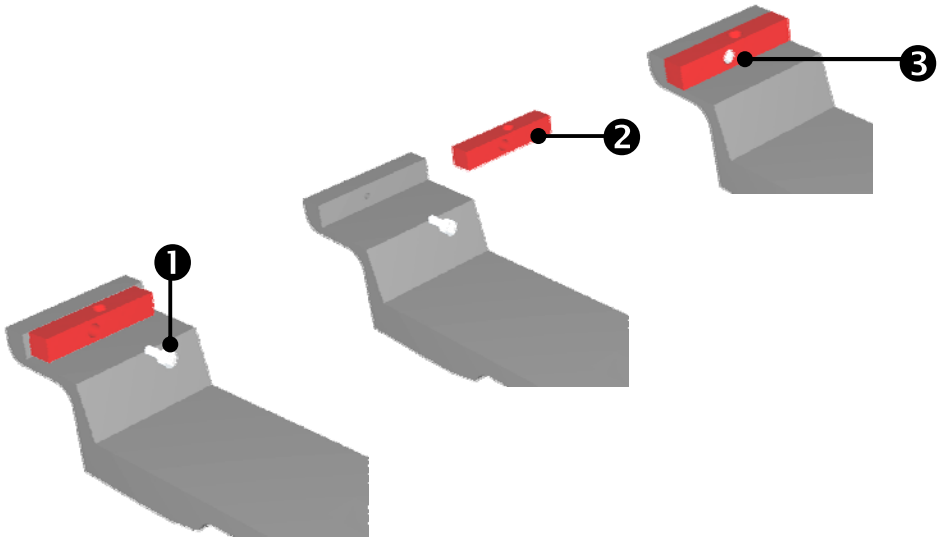
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the first plug and remove the fixing screws ❶.
- Clean the plug material and the resting base well.
- Rotate ❷ the material in the direction of the other hole.
- Close it once again with the screw ❸ previously removed. Repeat the operation on all the plugs present on the table.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



<u>If the rotation of the particular was already carried out another time, it is compulsory to remount a new plug.</u>

[1] **F10** Manual movements.

[2] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of plate resting-loading plugs present on 352BCS-LMT^{evo} tables

L-002

Estimated maintenance time 10 minutes.

The particulars which we will describe hereafter, despite being made of anti-cut material, are subject to wear and therefore it is necessary to replace them. It is not possible to define an interval of time and therefore the life of the plugs due to the fact that their wear depends on the conditions of the plates and on the method used to load the machine.

PREPARATION OF THE MACHINE

When operating on the machine to replace the loading plugs, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- To carry out the ascent of the plugs by means of the appropriate button placed on the table.
- **To remove the electric and pneumatic energy to the machine.** [3]

REMAINING RISKS

Use of mechanical utensils.

Individual protection devices to be used:

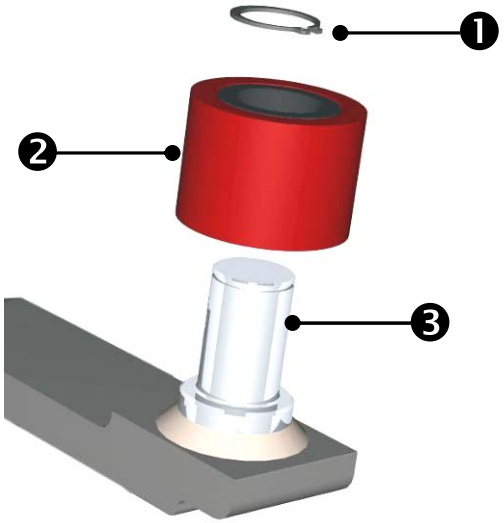
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the first plug and remove the Seeger ❶ which blocks the plug on the pin.
- Remove the worn plug ❷ and, after having carefully cleaned the pin ❸ and lubricated it with some common grease, insert the new plug.
- Insert the Seeger once again ❶ making sure that it is completely inserted in its seat.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[3] Consult section **E- Exclusion-restoration of energy** in this manual.

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90 degree small cutting head regulation

L-003

Estimated maintenance time 40 minutes.

The small head 90 degree regulation is surely one of the most important extraordinary maintenances to be carried out, because it guarantees the good quality of the incision and the tolerance on the quotas of the cut pieces.
This regulation allows aligning the small cutting head in the direction of the cut itself, so that it slides perfectly.

PREPARATION OF THE MACHINE

When operating on the machine to carry out the small cutting head 90 degree regulation, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- To prepare some **pieces of glass of an 800x200 dimension** on the machine table moving them with gloves for glass handling.

REMAINING RISKS

Glass movement and cut running.

Individual protection devices to be used:

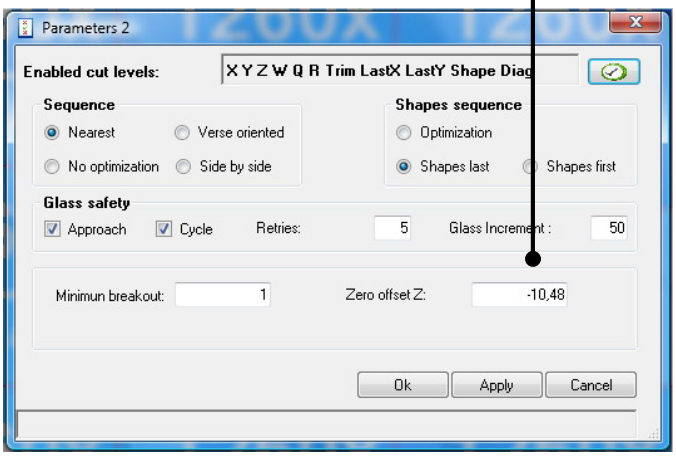
- Protective glasses.
- Five finger anti-cut gloves.

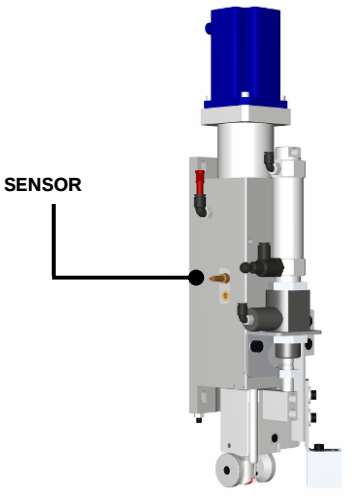
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

90 degree regulation of the small head is done carrying out a cutting cycle preset by the machine program and then going to modify a parameter present inside of the **Parameters 2 menu.**
The parameter to regulate is Offset zero Z.





PL-001

NOTE:

**The small cutting head reaches the zero position by means of a magnetic sensor which intercepts a cam.
From this position it is possible to move the small head zero increasing or decreasing the Offset zero Z value.
Depending on the machine configuration, increasing or decreasing this value, the small head zero position will be rotated clockwise or anti-clockwise.**

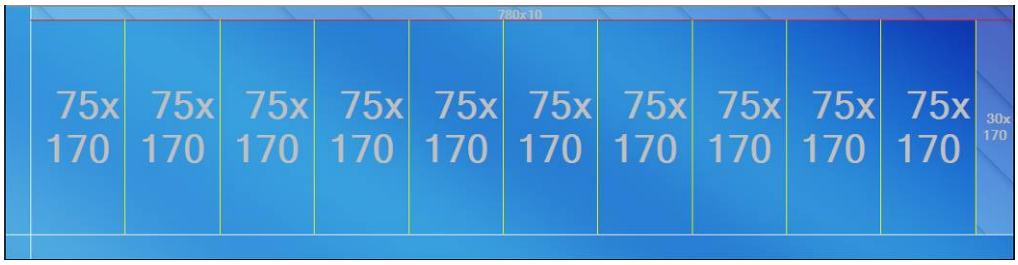
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

90 degree small head REGULATION on X axis:

From the main display one must go into the **Manual Controls** menu using the **F10** function key and with the mouse select the **X 90° degree icon.**

The BCMSWin program will display information on the dimension of the piece of glass to be used to carry out the regulation.

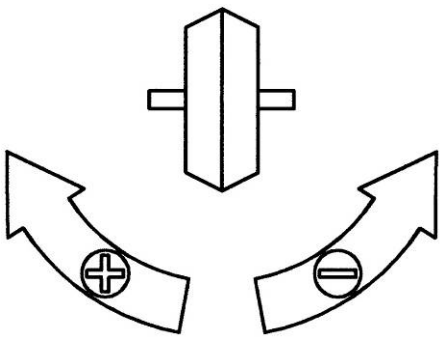
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Place on the table a **glass** with the dimensions of **800 x 200**[4].
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- **Press the CUTTING CYCLE button** located on the control panel.
- The machine carries out the incision of a scheme whose schematic design is shown hereafter.
- **Analyse the directions of the cutting path.**



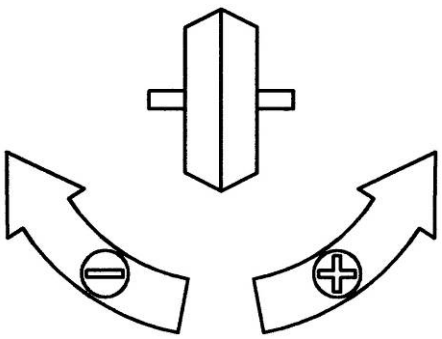
- When the cycle has ended, return to the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual and open the cut glass to check its dimensions.
- **Modify the Offset zero Z value.**

Every time this value is corrected, it will be necessary to repeat the execution of the test cycle, so as to verify the change made until the cut pieces are exactly equal among themselves.

As anticipated at the beginning of this chapter, this value can modify the position of the small cutting head clockwise or anti-clockwise, depending on whether the parameter is increased or decreased inside its field.
The two schematic designs which follow represent the small cutting head of a standard table (1st quadrant) or of a symmetrical table (2nd quadrant) and viewed from above. By means of arrows, it is indicated how the zero point is rotated, increasing or decreasing the value of **Offset zero Z.**



SYMMETRICAL



STANDARD

[4] Information suggested by the program.

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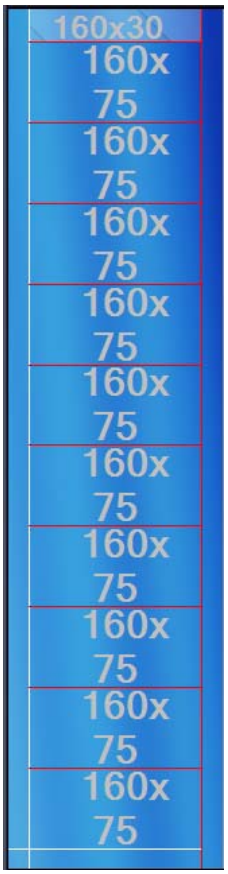
90 degree small head REGULATION on Y axis:

Once the 90 degree small head regulation of the X axis has been carried out, it is advisable to check it on the Y axis as well. To carry out the above-mentioned regulation, from the main display of the program, one must go into the **Manual Controls** menu, using the **F10** function key and with the mouse select the **Y 90° degree icon.**

The BCMSWin program displays information on the dimension of the piece of glass to be used to carry out the regulation.

Pressing the cycle key placed on the control panel, the machine will carry out the cutting cycle displayed in the figure at the side.



- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Place on the table a **glass** with the dimensions of **200 x 800**[5].
- Having finished the operation, leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- **Press the CUTTING CYCLE button** located on the control panel.
- The machine carries out the incision of a scheme whose schematic design is shown at the side.
- **Analyse the directions of the cutting path.**
- Return to the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual and open the cut glass to check its dimensions.

NOTE:

Since the machine is already regulated, all the pieces should be equal among themselves. Should there be differences between the pieces, it is advisable to correct still a bit more the Offset zero Z parameter until the correct value is found, after which the medium value of the two found during the X and Y 90° regulation must be inserted.

If the difference of the two values is equal or greater than 10 degrees, it is advisable:

1. **To replace the small cutting wheel with a new one checking that between the wheel itself and the insert there is no mechanical play.**
2. **To check possible mechanical play of the small head trying to rotate it manually. (in this case it is necessary to contact Bottero S.p.A. to program a revision)**

[5] Information suggested by the program.

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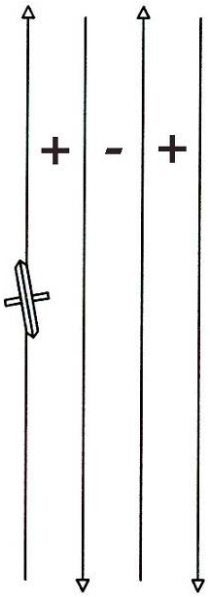
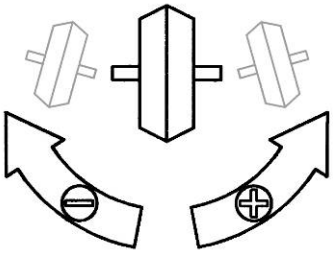
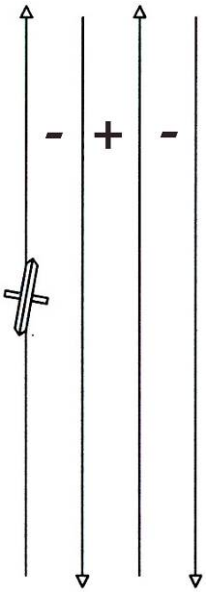
The following schemes show the example of four cuts made respectively with the small wheel rotated in the two possible wrong directions.
<u>During regulation, it is of fundamental importance to identify the cutting direction</u>: For this purpose, the direction is indicated in the following schemes by the arrows designed at the top of the incision.



Since the cuts should be equidistant between them, in this first case the distance between the first and the second, between the third and the fourth incision is greater than the distance between the second and the third.
Summarising, the first and third piece are larger than the second.

Vice versa, in the photograph on the right, the distance between the first and the second, between the third and the fourth incision is less than the distance between the second and the third.
Summarising, the first and third piece are smaller than the second.





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Cutting bridge diagonal regulation

L-004

Estimated maintenance time 10 minutes.

The correct regulation of the cutting bridge diagonals guarantees the good geometry of the finished pieces.
This regulation allows bringing the cutting bridge to 90 degrees as regards to the transmission guides.

PREPARATION OF THE MACHINE

When operating on the machine to carry out the cutting bridge diagonal regulation, it is compulsory:

- To carry out the cutting bridge diagonal check using the machine program[6].
- To note the dimensions of the two diagonals d1 and d2 which will be requested by the machine program.

REMAINING RISKS

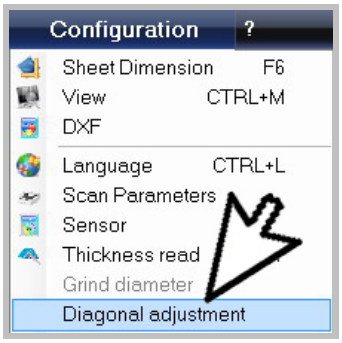
This operation does not foresee any remaining risks.

Individual protection devices to be used:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

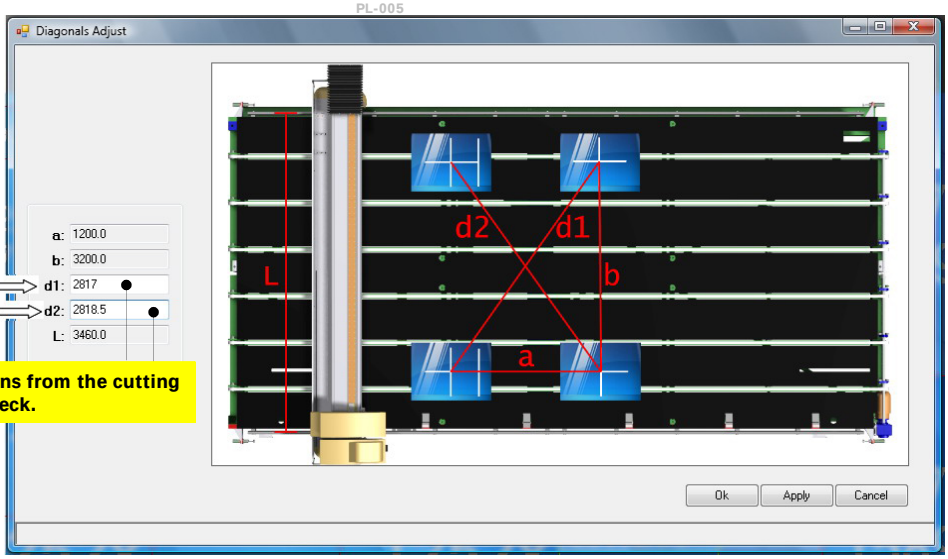
- From the BCMSWin main display, bring the mouse to the upper bar and click on **Configuration**.
- Click on the voice "**Diagonal Correction**".



PL-004

- A window will be displayed on which we should insert the dimensions of the two diagonals **d1 and d2**, previously obtained by the bridge diagonal check.

PL-005



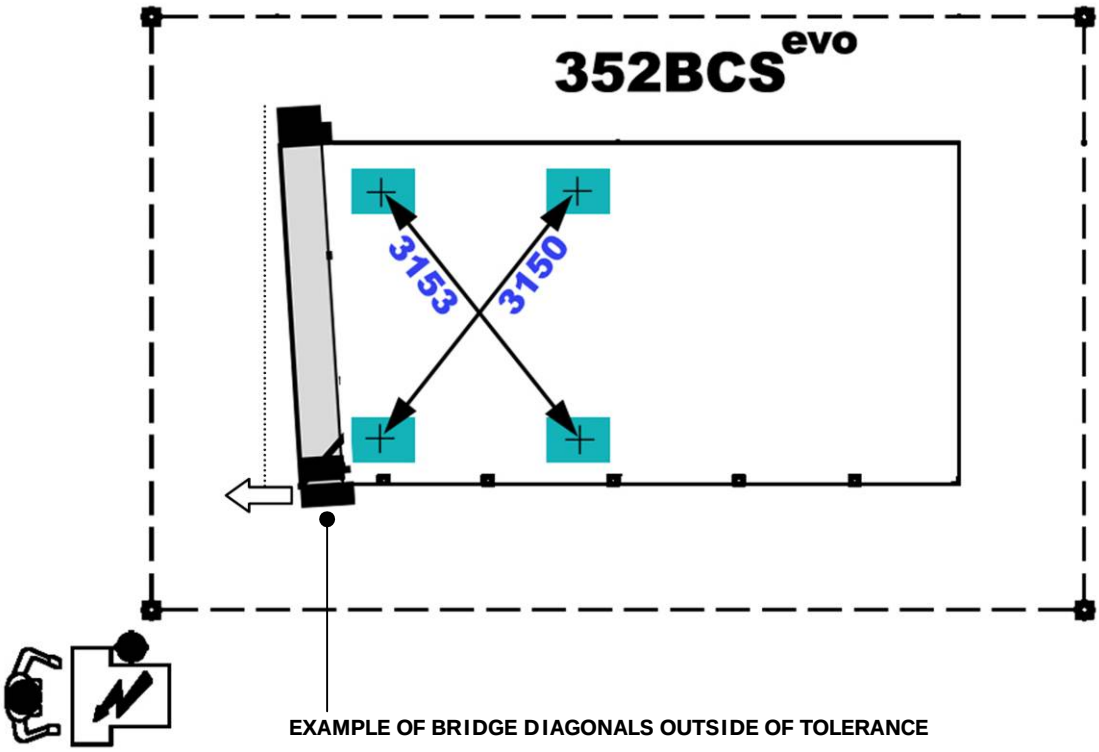
Detected dimensions from the cutting bridge diagonal check.

- **Confirm with OK**.

[6] To consult the subject **"I-Cutting bridge diagonal check"** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

At the start of the first cutting cycle, the machine will carry out the automatic correction of the cutting bridge diagonals.



EXAMPLE OF BRIDGE DIAGONALS OUTSIDE OF TOLERANCE

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

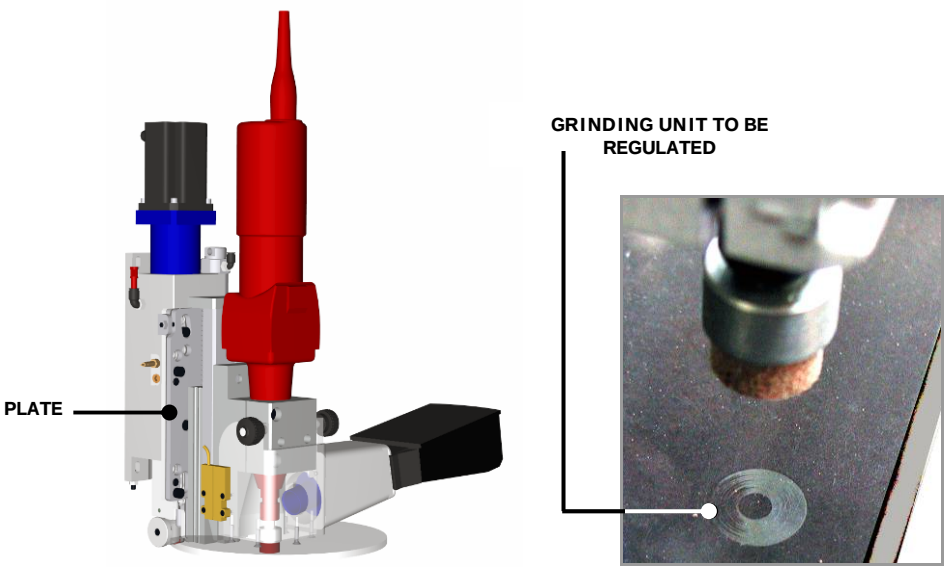
Regulation of small grinding wheel position on tables with Easy Deletion optional

L-005

352BCS^{evo} and 340BCS^{evo} tables

Estimated maintenance time 30 minutes.

The grinding unit is placed on a plate fixed to the trolley which with time needs its assembly checked. To obtain the best grinding quality **this plate must be perfectly regulated at 90 degrees regarding the work surface.**



PREPARATION OF THE MACHINE

When operating on the machine to carry out the grinding unit position regulation, it is compulsory:

- To reset the axles of the machine.
- To place a piece of low emissive glass on the table [7] using gloves for glass handling.

REMAINING RISKS

Glass movement.
Utensil use.

Individual protection devices to be used:

- Protective glasses.
- Five finger anti-cut gloves.

As well as:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)
- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Check that the cutting trolley does not have any mechanical play[8].
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Have the machine carry out a grinding cycle.

[7] **Minimum dimensions 600x600**.

[8] In case of mechanical play, contact Bottero S.p.A. Technical Assistance.

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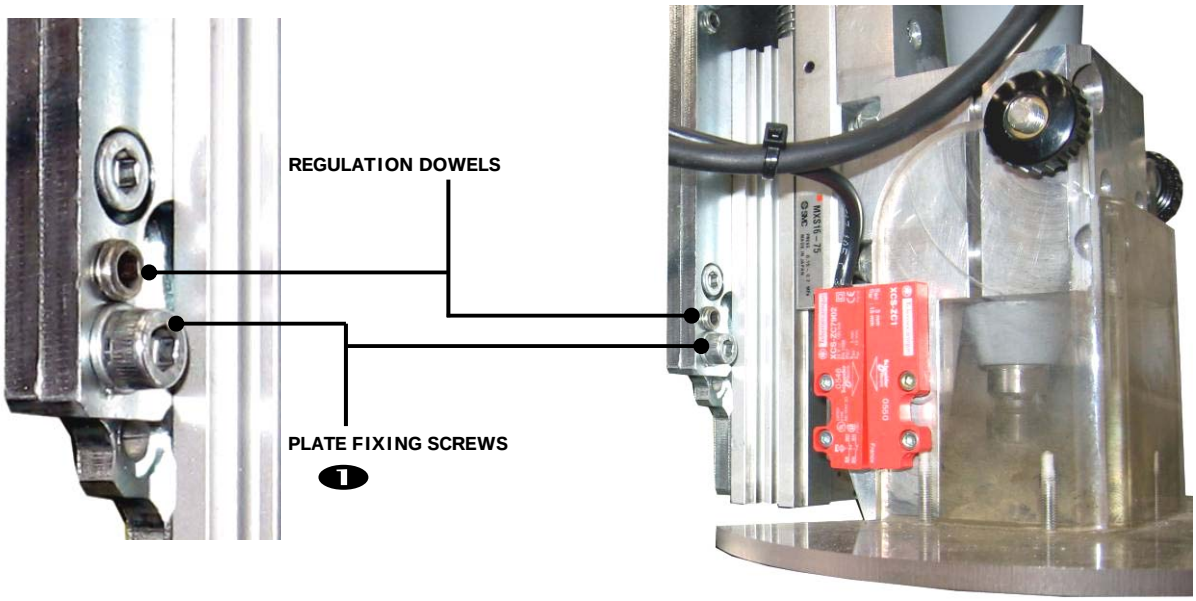
- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Visibly check the grinding quality and therefore assess the direction in which the whole grinding unit should move.
- Disassemble the grinding unit protection carter.
- Lightly loosen the fixing screws ❶ and begin to regulate the dowels ❷ or to incline the unit by means of the mechanical play existing in the fixing holes.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a new grinding cycle and check the grinding quality.
- Carry out the operations listed above until reaching the desired quality.



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Calibration of the glass detection photocell

L-006

Estimated maintenance time 30 minutes.

The detection photocell allows identifying the correct position of the glass on the cutting table and therefore it guarantees the correct positioning of the small head regarding the plate edge.
An incorrect calibration of the photocell can cause dimension errors in the cutting of the plate edge as well an incorrect detection of the profile of the shapes for the machines provided with Shape Scanner.
The calibration of the photocell requires three regulations: one **mechanical,** one **electrical** and one **on the software**.

PREPARATION OF THE MACHINE

When operating on the machine to carry out the glass detection photocell calibration, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.**[9]
- To remove the protection carter mounted on the trolley and the protection carter of the photocell.
- To place on the table a glass 6 millimetres thick and a sheet of white paper.
- Verification instrument.

REMAINING RISKS

Glass movement.
Utensil use.

Individual protection devices to be used:

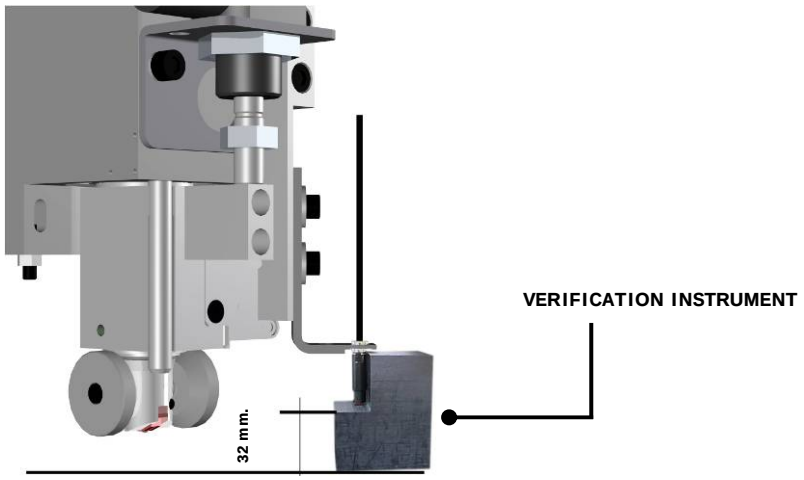
- Five finger anti-cut gloves.
- Light leather five finger gloves

As well as:

- Adequate clothing.
- Accident prevention shoes.

MECHANICAL CALIBRATION OF THE PHOTOCELL

BOTTERO S.p.A. supplies, together with the cutting table, an instrument that allows regulating the height and the perpendicularity of the photocell regarding the work surface.
Placing this instrument below the photocell, the maintenance is able to control the correct position of the sensor. In case this is not positioned correctly, one must intervene following the instructions described on the following page.

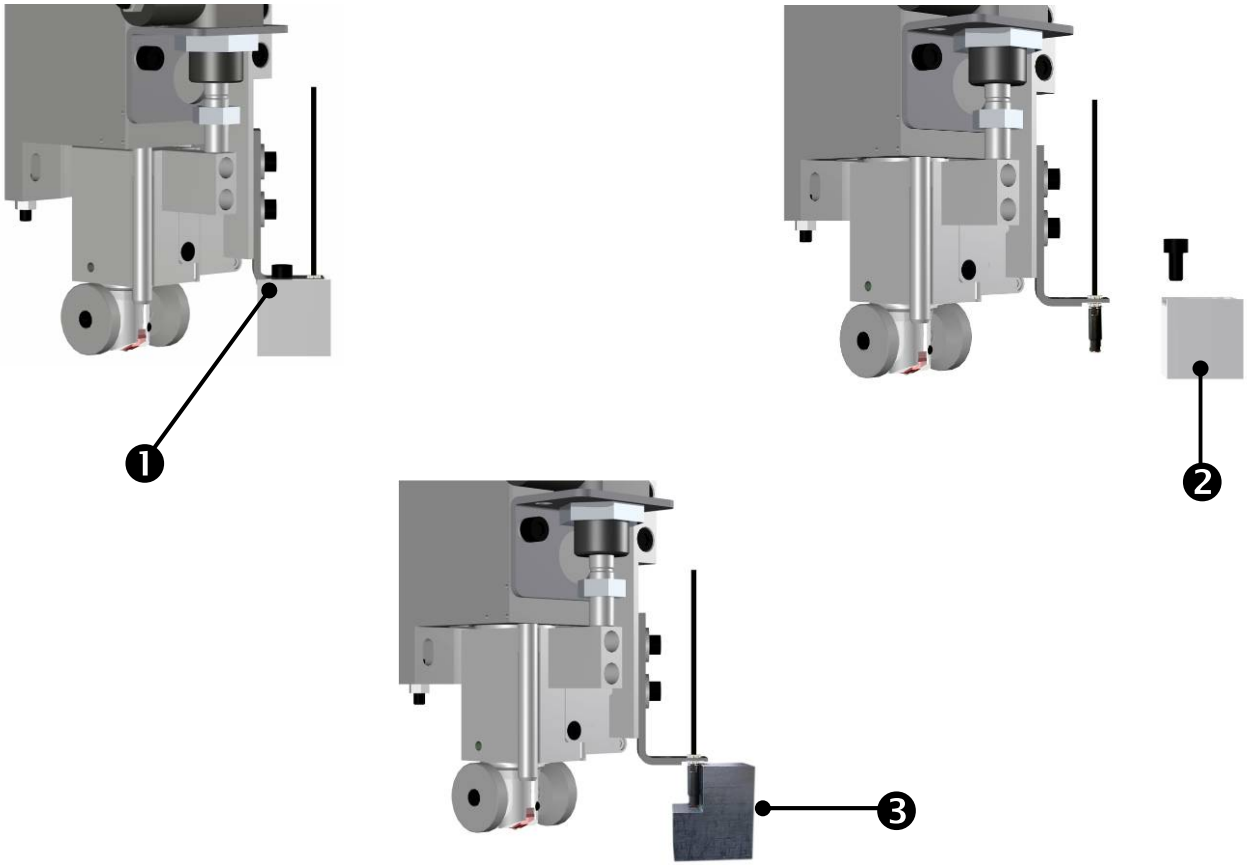


[9] Consult section **E- Exclusion-restoration of energy** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas in this manual.**
- Reach the cutting trolley and remove the screw ❶ which blocks the protection carter.
- Take off the carter. ❷
- Insert on the work surface[10] and below the photocell the bracket ❸ provided with the machine.
- Check that the 90 degrees of the photocell are correct on the whole circumference of the same.
- If regulation is needed, loosen the fixing screws of the bracket and carry out the desired regulation.
- Fasten the screws once again and check the correct regulation.
- Having finished, reassemble the protection carter and leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

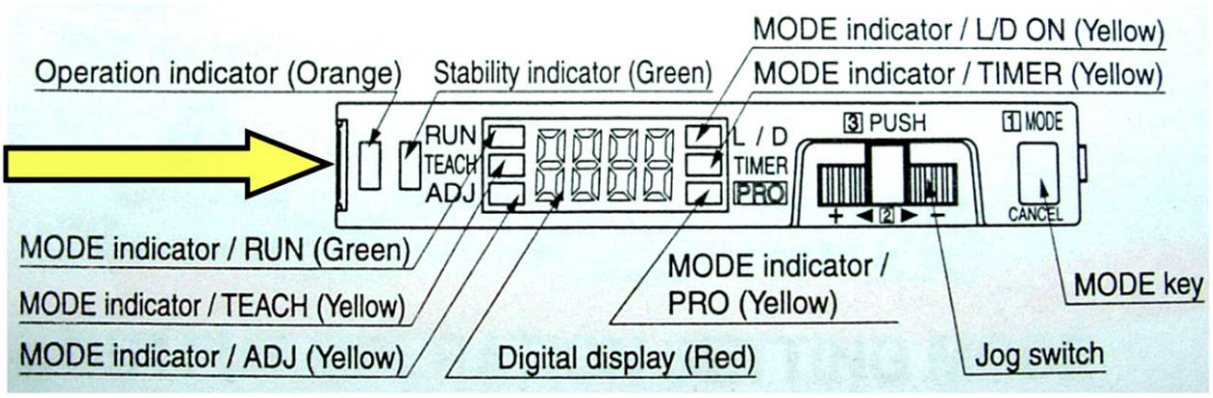


[10] **Check that the felt is not deteriorated in the resting position of the bracket.**

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

ELECTRONIC CALIBRATION OF THE AMPLIFIER

To carry out the electronic calibration, operate as described hereafter:



RESET PROCEDURE:

1. Press the emergency button located on the control panel.
2. Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
3. Reach the cutting trolley.
4. Remove the plastic protection carter from the amplifier.
5. Make sure that no object is present below the lens.
6. Pressing the button **1MODE** 5 times **PRO** mode is selected.
7. Moving the **3PUSH** selector (jog switch) to the minus sign, see the display **PRO5.**
8. Paying attention not to move it, press the **3PUSH** selector just one time, on the display will appear **CODE.**
9. Moving the **3PUSH** selector one time to the minus sign, see on the display **rSEt.**
10. Press the **3PUSH** selector, a flashing **YES will appear.**
11. Press the **3PUSH** selector to confirm. 4 lines will appear on the display which confirm that the reset procedure has been done.
12. Control that the amplifier is in **RUN** mode. Check as well that the two leds (green and orange) at the top are both lit.

CALIBRATION OF THE SENSOR:

1. Make sure that the sensor is on and place a 6 mm thick glass under the lens with a sheet of white paper above.
2. Pressing the 1MODE button once, **TEACH** mode is selected.
3. Paying attention not to move it, press the **3PUSH** selector once. When the reading has been acquired the **TEACH** led will flash.
4. Remove the glass and the white sheet of paper from below the sensor.
5. Press the **3PUSH** selector once. When the reading has been acquired, **the** TEACH led will remain lit and on the display **GOOD** will appear, which confirms the good result of the calibration.
6. Pressing the 1MODE button 5 times, return to the **RUN** mode.
7. Check that the green led (stability indicator) is lit.
8. Reassemble the plastic carter.
9. Leave the table working area making sure that no one is inside and restore the emergency button located on the control panel.

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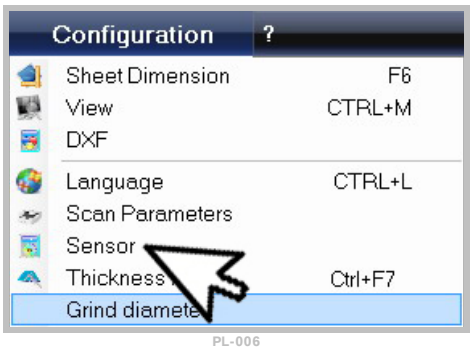
CALIBRATION OF PHOTOCELL POSITION SOFTWARE

This function allows regulating offset, that is, the distance between the detection photocell and the cutting head. If well regulated, this parameter ensures that the cuts at the edge of the plate are effectively the desired quota and that the edging is correct.
If not, this function must be enabled and one must proceed to its regulation as described hereafter.

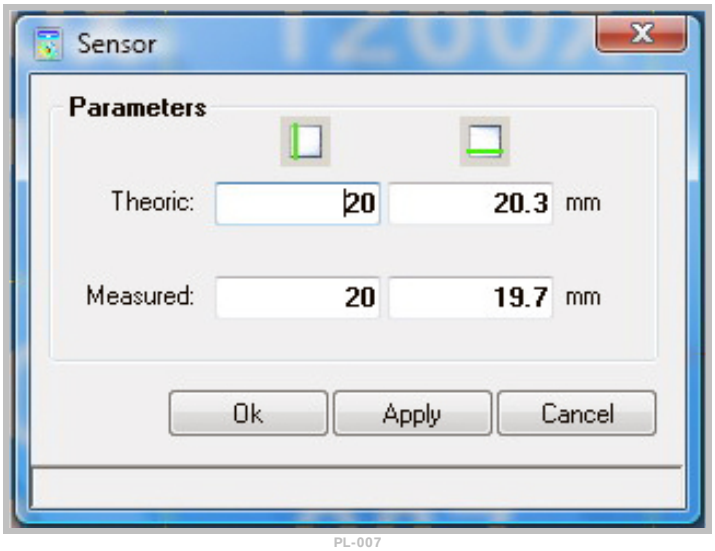
DESCRIPTION OF THE OPERATION

After having cut a plate with edgings, measure their dimensions (on the cut, without cut them off) and take note of them.
By means of the software and using the key combination ALT+C we visualise the bar with the machine configuration menu.



PL-006

- **We click on the Sensor function** or we bring the cursor above the writing and **we press ENTER.**



PL-007

- **In the Theoretical fields** we insert the edging values which we previously cut.
- Insert in the **Measured fields** the effective value of the two edgings cut by the machine.
- **Confirm the regulation pressing the icon button OK.**

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Calibration of glass thickness encoder

L-007

Estimated maintenance time 15 minutes.

On the cutting machines, this component called encoder allows reading the glass thickness and based on it, to exercise on the glass the correct incision pressure value.

PREPARATION OF THE MACHINE

When operating on the machine to carry out glass thickness sensor calibration, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- To place a 3 millimetre thick piece of glass on the table[11] and one 19 millimetres thick.[12]

REMAINING RISKS

Glass movement.

Individual protection devices to be used:

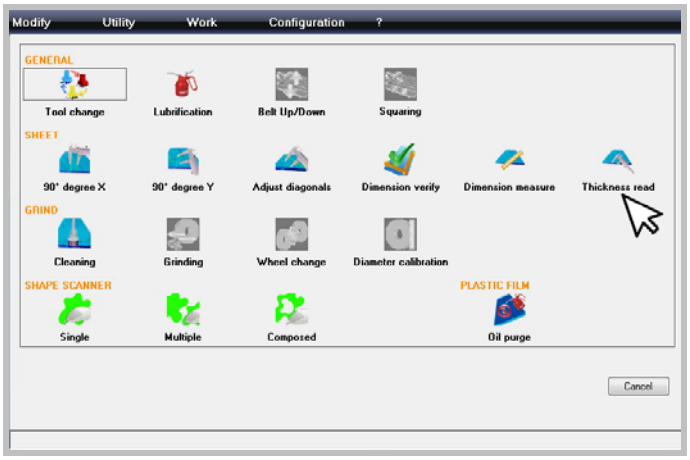
- Five finger anti-cut gloves.

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Insert on the cutting table in a precise position the 3 millimetre piece of glass.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- On the BCMSWin main display press the **F10 function key**.
- Bring the mouse to the **PLATE** column and click **Thickness reading**.



PL-008

- **Press the cycle key.**

NOTE:

The cutting bridge will move to a predefined distance and the small head will descend upon the glass detecting the glass thickness.

[11] 0.118 Inch.

[12] 0.748 Inch.

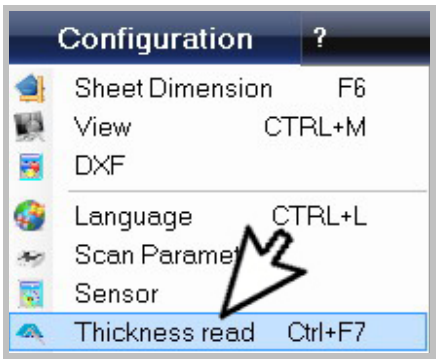
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

- **Remove electrical and mechanical energy from the machine bringing it to zero energy.**[13]
- Remove the glass using anti-cut gloves and insert the 19 millimetre thick one.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Press the cycle key.
- Exit the display clicking Cancel.

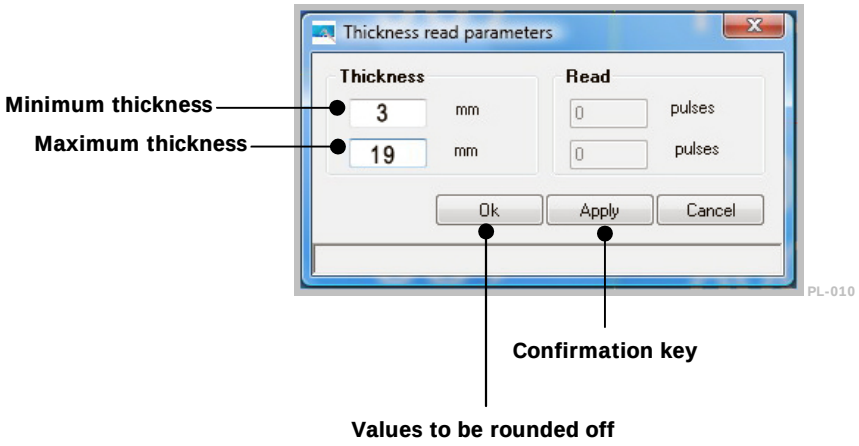
NOTE:

The bridge will detect the thickness of the glass on the cutting table.

- Bring the mouse to the upper bar and click **Configuration**.



- Open the "**thickness read"** menu and correct the thicknesses rounding off the value to 3 and 19.
- **Confirm with OK**.



NOTE:

If during the cutting test, the head does not descend correctly, check the approach pressure in ALT+2 (If too high, the cutting wheel bumps the glass surface. On the other hand if it is too low it risks not cutting the first millimetres).

Check that the sensor is placed about 0.4 mm[14] from the magnetic band.

[13] Consult section **E- Exclusion-restoration of energy** in this manual.

[14] 0.016 Inch.

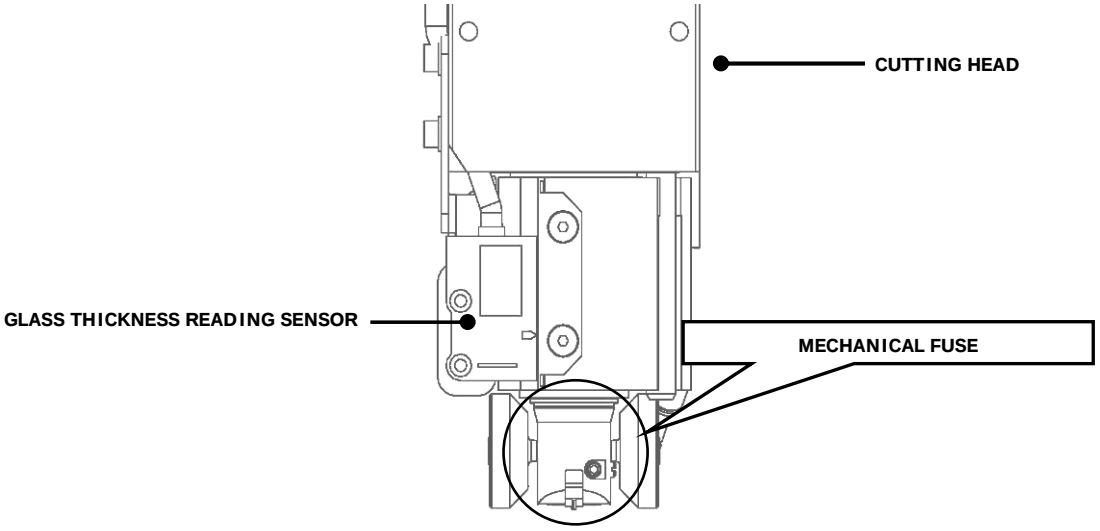
Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of the mechanical fuse on the cutting head

L-008

Estimated maintenance time 30 minutes.

The **mechanical fuse** is no other than the last part of the cutting head where the tool holder and the cutting wheel are inserted. Accidental bumping of the cutting head against the edge of a glass often makes the **mechanical fuse** break, avoiding damage to the whole incision device.
Remember that the machine is constructed so that the cutting utensil always runs on the glass surface without ever bumping in any way on the plate edge. A **mechanical fuse** break therefore is due to a wrong programming of the working cycle or tampering with the safety systems which detect the presence of glass. Bottero S.p.A. supplies a complete set of wheels and bolts and screws together with the purchased machine.

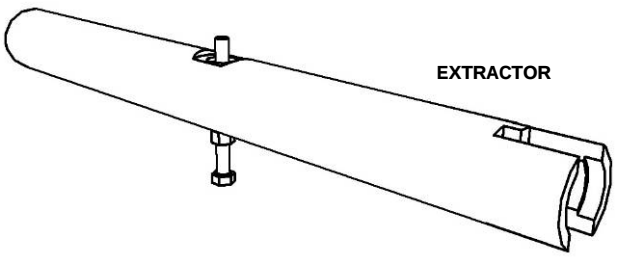


TECHNICAL INFORMATION

The **mechanical fuse** always breaks at a specific point.
The external part (where the cutting wheel is mounted) detaches from the stem, while the pin remains inside.
To replace it, one must first extract the broken pin from the stem and then to mount the new mechanical fuse.

EQUIPMENT USED

Bottero S.p.A. supplies a specific extractor to take the pin out of the stem of the head.



Besides this tool, it is necessary to use two 8 [mm] hex keys[15], a 3 [mm] screwdriver[16], a 300 gram rubber hammer and a 2 [mm] hex key[17].

[15] 0.315 Inch.
[16] 0.118 Inch.
[17] 0.079 Inch.

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PREPARATION OF THE MACHINE

When operating on the machine to replace the mechanical fuse, it is compulsory:

- To set the “Offset Z axle" parameter to zero on the Parameters 2 menu.
- To reset the axles of the machine.
- To remove any glass present on the cutting table surface using anti-cut gloves.
- To remove electrical and mechanical energy from the machine bringing it to zero energy.[18]
- To remove the black plastic cap inserted on the work surface and mounted in the zero machine zone.
- To provide oneself with a new mechanical fuse.
- To prepare the equipment for the disassembly of the broken fuse supplied by Bottero S.p.A.
- To position (manually pushing) the bridge and the trolley so that the cutting head corresponds to the appropriate hole on the work surface.
- To clean any oil left on the head stem.

REMAINING RISKS

Bumping the table carpentry.
Use of mechanical utensils.

Individual protection devices to be used:

- Protective helmet.
- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

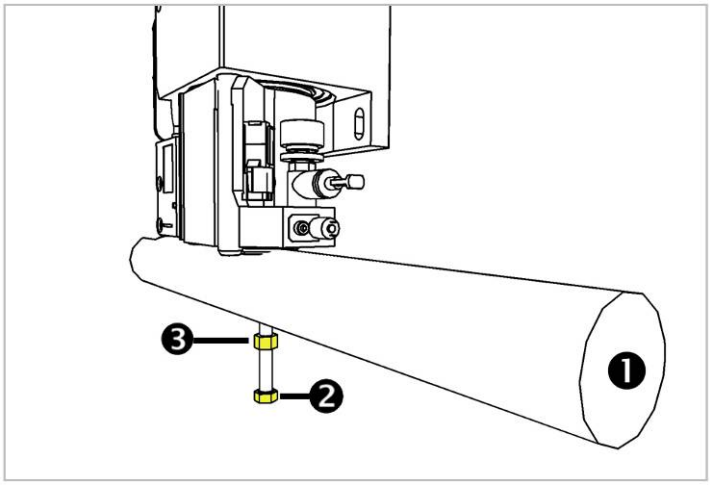
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

Extraction of the broken pin from the head stem

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Position the extractor supplied by Bottero S.p.A. ❶ below the cutting head and tighten the screw ❷ inside the pin until it reaches the end of the thread.
- Holding the screw still, ❷ with an 8 mm. hex key tighten the nut ❸ until the pin of the **mechanical fuse** is extracted from the stem.
- Carefully clean the seat in which the pin was inserted and make sure that it is not damaged or deformed.



[18] Consult section **E- Exclusion-restoration of energy** in this manual.

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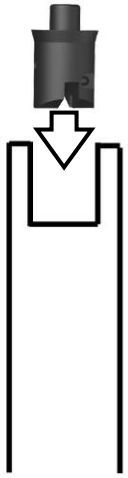
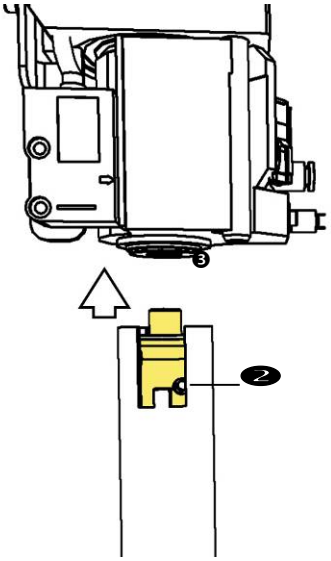
Mechanical fuse mounting

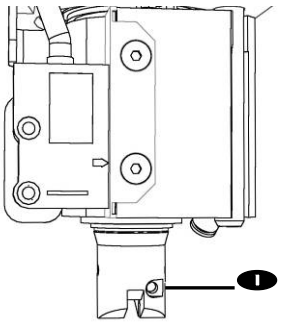
- Place the new **mechanical fuse,** without wheels ❶ and screws **with the dowel hole facing the front position** ❷, in the extractor seat.
- Using a rubber hammer, drive the new **mechanical fuse** into the stem ❸ of the cutting head.

WHEELS TO BE DISMANTLED

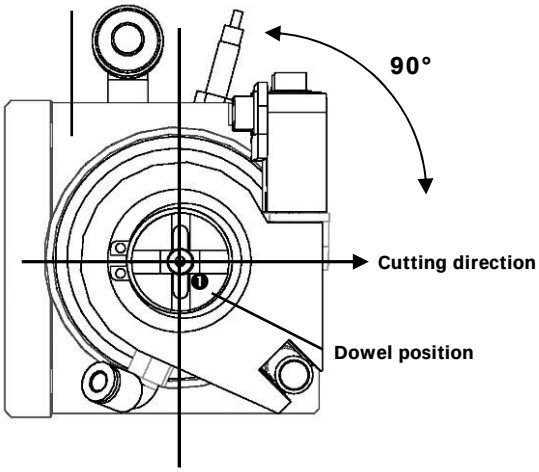




FRONTAL VIEW



HEAD SEEN FROM BELOW



NOTE:

While hammering the new mechanical fuse pay attention to:

1. **Mounting the new fuse respecting the cutting wheel axle.**
2. **The pin must enter the seat completely, until the mechanical fuse surface and the stem touch one another.**

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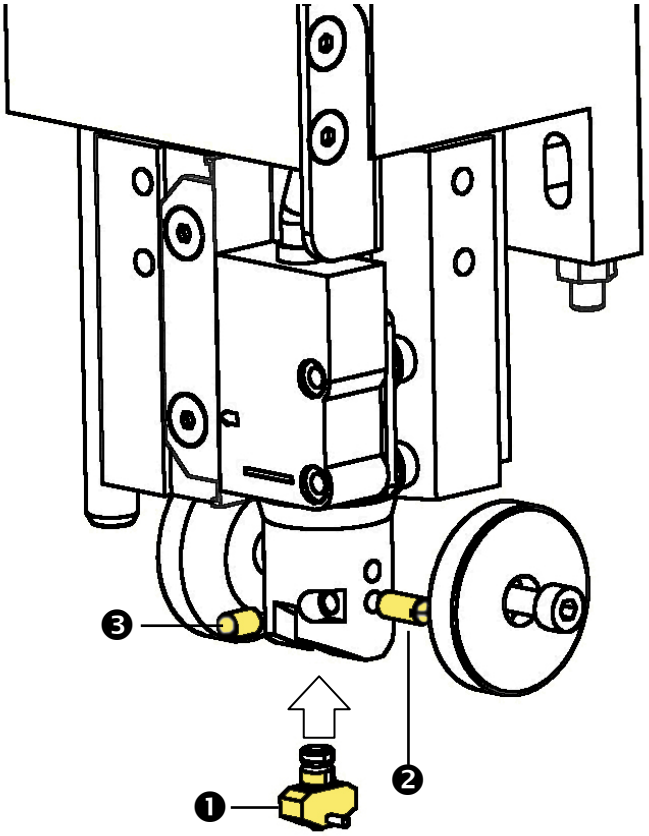
Mounting and regulation of tool holder



- Insert the tool holder ❶ inside the new **mechanical fuse**.
- Holding the tool holder in position, screw the positioner ❷ until the sphere touches the tool holder itself.
- Try to extract and to insert the tool holder to check that the positioner works correctly.
- Block the positioner using the embedded hexagon head screw. ❸
- Mount the black plastic cap on the work surface.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.
- Carry out a lubrication overflow using the appropriate function on the machine software.
- Carry out the 90 degree[19] cutting head regulation.

[19] Consult the subject **"Cutting head 90 degree regulation"** in this manual.

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

Replacement of plate stop-presence end run spherical head

L-009

Estimated maintenance time 10 minutes.

The particular which we will describe, despite being made of anti-cut material, is subject to wear and therefore **it is compulsory to replace it every 2 years of machine work**.

PREPARATION OF THE MACHINE

When operating on the machine to replace the plate stop-presence end run head, it is compulsory:

- To remove any pieces of glass present on the machine by using gloves adequate for handling glass.
- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.** [20]

REMAINING RISKS

Use of mechanical utensils.
Bumping the table carpentry.

Individual protection devices to be used:

- Light leather five finger gloves. (anti-cut gloves are not compulsory for handling glass)

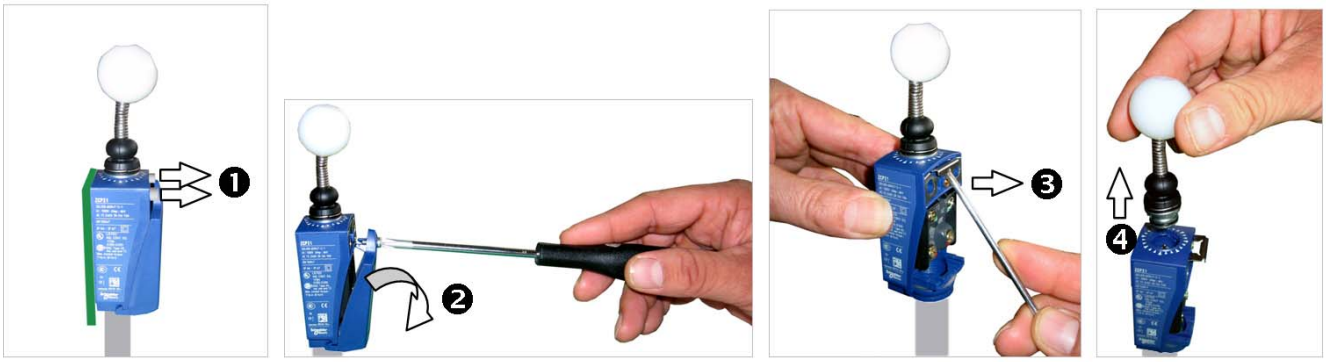
As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

DISMANTLING WORN HEAD

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this manual.
- Identify the hole on the cutting table that receives the plate stop-presence end run.
- Go beneath the cutting table and dismantle the end run removing the two fixing screws. ❶
- Loosen the screw ❷ which blocks the end run plate.
- Insert the tip ❸ of the screwdriver on the fork and take it out.
- Remove the worn ❹ spherical head.



[20] Consult section **E- Exclusion-restoration of energy** in this manual.

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MOUNTING OF NEW HEAD

- Insert the new head ❶ inside the end run.
- Push the fork forward ❷ to block the small bar.
- Close the end run ❸ plate.
- Mount the end run on the table frame once again ❹ paying attention that it is perpendicular to the table.
- Make sure the end run clicks.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.

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Replacing carriage extra-run rubber buffers

L-010

Estimated maintenance time 10 minutes.

This rubber piece, used for slowing down the carriage during the extra-run stop, is subject to deterioration. **It is mandatory to replace it once it visibly shows clear damage to the material.**

MACHINE PREPARATION

When operating on the machine to replace the rubber buffer used to stop the carriage, it is compulsory to:

- Remove any pieces of glass present on the machine using gloves that are suitable for handling glass.
- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.** [21]

RESIDUAL RISKS

This operation does not present any residual risks.

Individual protection devices to be used:

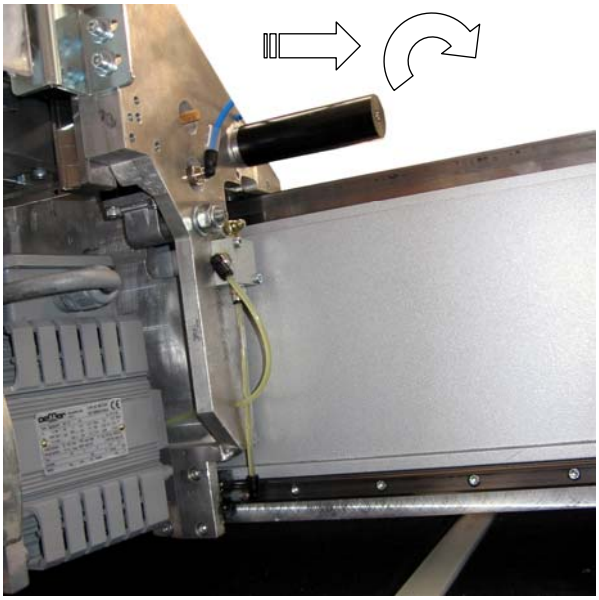
- Five finger gloves in light leather. (anti-cut gloves are not mandatory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this instructions manual.
- Locate the damages piece installed on the side of the cutting carriage.
- With hands move the rubber buffer towards the outside and, rotating it slightly, remove the piece.
- Insert the new rubber buffer into the pin using a rotation and pressure towards the inside.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[21] Consult section **E- Exclusion-restoration of energy** in this manual.

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Replacing bridge extra-run rubber buffers

L-011

Estimated maintenance time 10 minutes.

This rubber piece, used for slowing down the bridge during the extra-run stop [22], is subject to deterioration. **It is mandatory to replace it once it visibly shows clear damage to the material.**

MACHINE PREPARATION

When operating on the machine to replace the rubber buffer used to stop the bridge, it is compulsory to:

- Remove any pieces of glass present on the machine using gloves that are suitable for handling glass.
- To reset the axles of the machine.
- **To remove the electric and pneumatic energy to the machine.** [23]

RESIDUAL RISKS

Use of mechanical utensils.

Individual protection devices to be used:

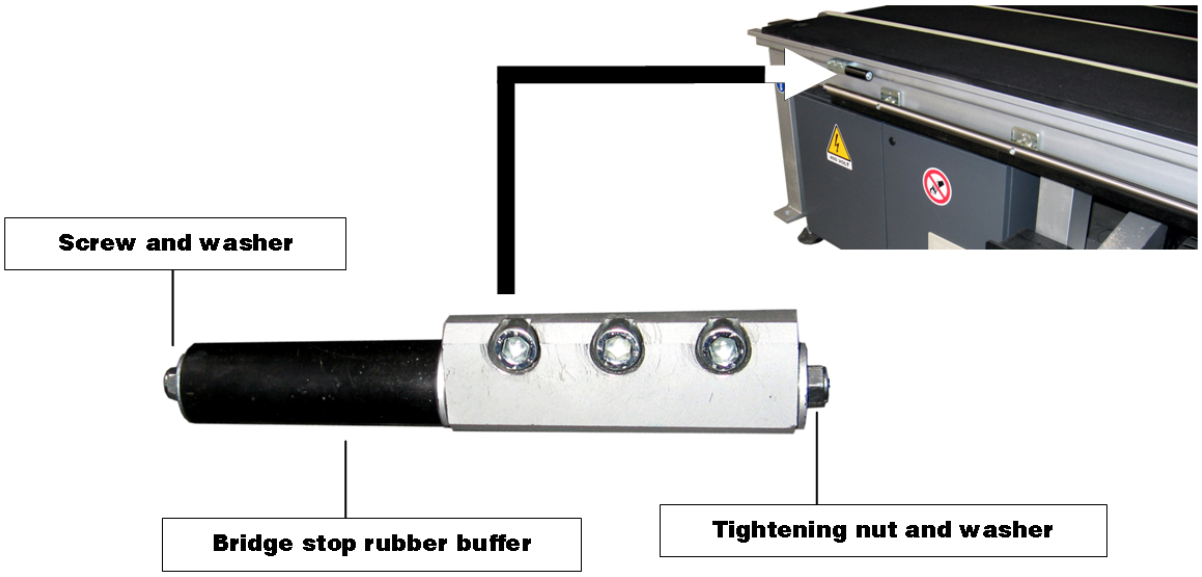
- Five finger gloves in light leather. (anti-cut gloves are not mandatory for handling glass)

As well as:

- Adequate clothing.
- Accident prevention shoes.

DESCRIPTION OF THE OPERATION

- Access the working area scrupulously keeping to the procedures reported in the section **D-Access to the machine working areas** in this instructions manual.
- Locate the damaged piece that is installed on the bridge guides.
- Using two box wrenches loosen the screw that locks the rubber to the fastening bracket.
- Remove the washer and then the deteriorated rubber.
- Insert a new rubber into the screw.
- Put the washer and the self-locking nut back on.
- Using the two wrenches tighten the nut until it reaches the screws external thread.
- Leave the table working area making sure that no one is inside, restore energy to the machinery following the operations described in this manual in section **E-Exclusion-restoration of energy** and restore the operator protection circuits.



[22] When there is bumping against the buffer, verify that the bracket fixing screws that hold the rubber tip are tight.

[23] Consult section **E- Exclusion-restoration of energy** in this manual.

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R SPARE PARTS

SECTION SUMMARY

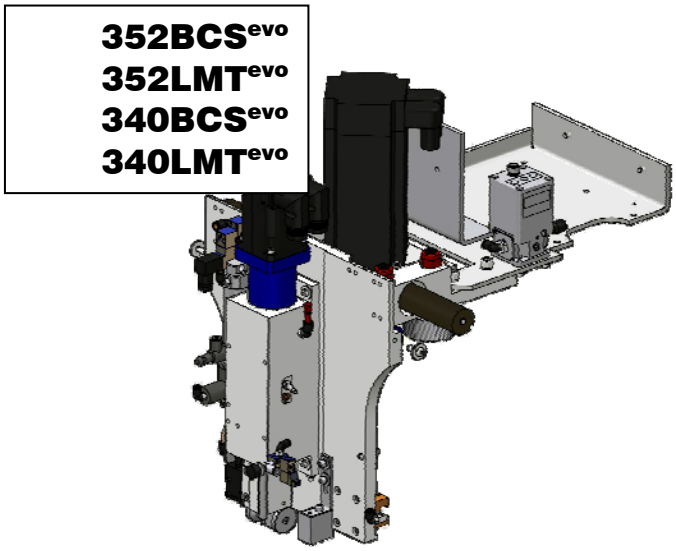
Consumables **R-3**
SMALL CUTTING WHEELS R-3
VINYL INCISION TOOL HOLDER FOR SANDING R-5
GRINDING WHEEL FOR LMT EVO SERIES CUTTING TABLES R-6
GRINDING WHEEL FOR CUTTING TABLES WITH OPTIONAL EASY DELETION R-8
CUTTING OILS R-9

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

CONSUMABLES

R-000

Here is a list of consumables to be used with the Evo series machines.



SMALL CUTTING WHEELS

Producer	
BOHLE SILBERSCHNITT	
Model	
Active Series with a Ø 5 [mm] small wheel	

Code	Description
MR8050125	127° Small wheel colour Yellow
MR8050135	135° Small wheel colour White
MR8050145	145° Small wheel colour Black
MR8050155	155° Small wheel colour Red
MR8050165	165° Small wheel colour Green

Producer	
FLETCHER	
Model	**Model**
PC 215 RG & CR Ø 5 [mm] Series	

Code	Description
MR8015325	130° Small wheel colour Yellow
MR8015335	135° Small wheel colour White
MR8015345	145° Small wheel colour Black
MR8015355	155° Small wheel colour Red
MR8015365	165° Small wheel colour Blue

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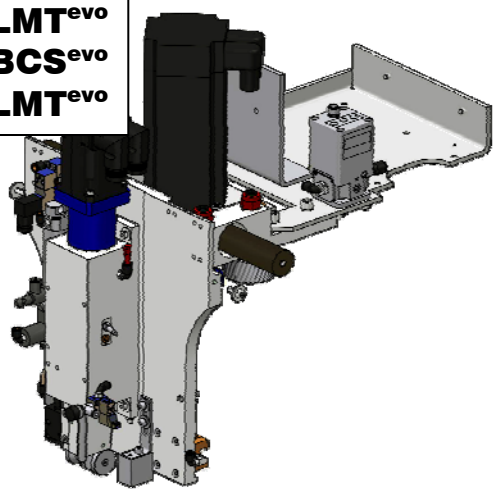
352BCS^{evo}
352LMT^{evo}
340BCS^{evo}
340LMT^{evo}



Code	Description
G501-02-139	Bottero metal tool holder
MR8050906	Small wheel Pin
MP7510006	Halder Eh-2205.004 Positioner

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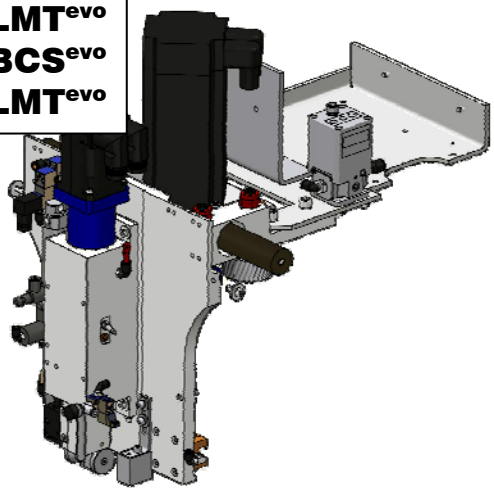
VINYL INCISION TOOL HOLDER FOR SANDING

352BCS^{evo}
352LMT^{evo}
340BCS^{evo}
340LMT^{evo}



Producer	
BOHLE SILBERSCHNITT	

Code	Description
MR8050920	Tool for shaped cuts in steel
MR8050910	Tool for shaped cuts in plastic
Code	**Description**
SP4710441	Half round nose pliers

Producer	
BOHLE SILBERSCHNITT	

Code	Description
MR8050912	Tool for straight cuts in plastic
MR8050922	Tool for straight cuts in steel

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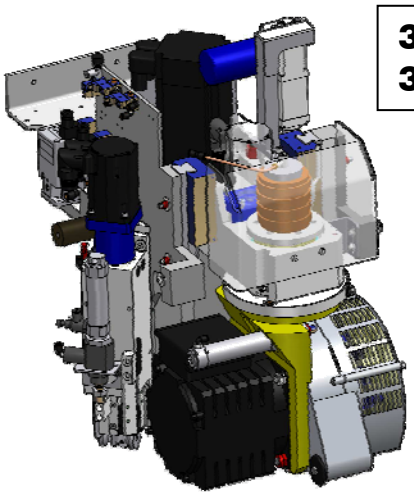
GRINDING WHEEL FOR LMT EVO SERIES CUTTING TABLES



352LMT^{evo}
340LMT^{evo}

Producer	**Grinding wheel thickness 20 millimetres**
ARTIFEX	

Code	**Description**
MM6226923	Grinding wheel for Low-e glass d.200/76.2x20 SG100HT
MM6226924	Grinding wheel for Low-e glass d.200/76.2x20 SG100MT
MM6226925	Grinding wheel for Low-e glass d.200/76.2x20 SK-180-HT
MM6226926	Grinding wheel for Low-e glass d.200/76.2x20 NK-220-HT

Producer	**Grinding wheel thickness 20 millimetres**
HEGLA	

Code	**Description**
MM6226921	Grinding wheel for Low-e glass d.200/76.2x20 9a807-BE14TF

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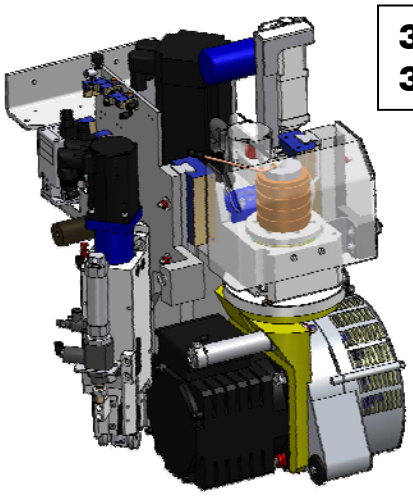


352LMT^{evo}
340LMT^{evo}

Producer	Grinding wheel thickness 22 millimetres
HEGLA	

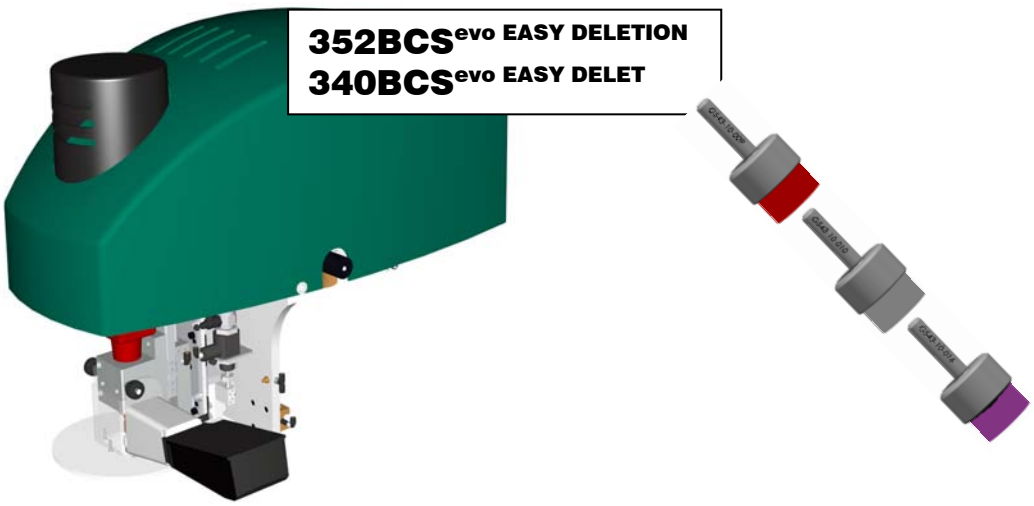
Code	Description
MM6226971	Grinding wheel for Low-e glass d.200/76.2x22

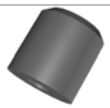
Producer	Grinding wheel thickness 22 millimetres
ARTIFEX	

Code	Description
MM6226973	Grinding wheel for Low-e glass d.200/76.2x22
MM6226974	Grinding wheel for Low-e glass d.200/76.2x22
MM6226975	Grinding wheel for Low-e glass d.200/76.2x22
MM6226976	Grinding wheel for Low-e glass d.200/76.2x22

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

GRINDING WHEEL FOR CUTTING TABLES WITH OPTIONAL EASY DELETION



Producers	
VARIOUS	
Code	**Description**
G543-10-009	Grinding wheel SG100HT red
G543-10-010 	Grinding wheel SK180HT grey
G543-10-016	Grinding wheel B46 RBM purple

Producer	
BOTTERO	
Code	**Description**
G543-10-018	Tool holder
PF3510900	Filter

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

CUTTING OILS

352BCS^{evo}
352LMT^{evo}
340BCS^{evo}
340LMT^{evo}

Supplier	
NEOSTUCCO	
Code	**Description**
ZO5090056	**L.3** ACECUT-5250 GLASS CUTTING OIL
ZO5090055	**L.3** ACECUT-4153 GLASS CUTTING OIL

ACECUT-5250

Oil that evaporates rapidly and completely, for mirrors, metallised glass, reflective glass, normal and layered glass.

ACECUT-4153

Semi-fluid oil, it is used for cutting very thick glass and shaped pieces.

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W

ATTACHMENTS

SECTION SUMMARY

Specific techniques _____ W-3
Electrical schemes _____ W-3
Pneumatic schemes _____ W-3
EC Certificate sheet _____ W-3

Everything contained in this instruction booklet is strictly reserved, confidential and must not be disclosed in any way.

The technical data and the machine specifics are not an integral part of the use instruction manual but are given separately.

Specific techniques

W-001

For all data regarding the characteristics and the specific techniques of the machine purchased by you, refer to the stipulated contract.

Electrical schemes

W-002

The electrical documentation is delivered in the appropriate documentation box where a copy of the machine program and other utilities for the client are also enclosed.

Pneumatic schemes

W-003

The documentation regarding the pneumatic schemes of the machine is only supplied **upon explicit request by the client**.
Some information on electrovalve, tubes and pneumatic component codes are supplied in the machine or line spare parts booklet.

EC Certificate sheet

W-004

The certificate sheet CE is inserted in the appropriate documentation box which will be delivered to the client when installing the machine or the line.

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Notes:

Aggiornato da: Giovanni Isoardi

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Glass Technologies

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